DOCUMENT RESUME

ED 126 050	95	SP 010 246

AUTHOR	Hein, William H., Jr., Ed.
TITLE	A Laboratory Facility Dedicated to Educational R&D, Volume II. Technical Attachments for Papers 1-5, Volume I.
INSTITUTION	Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, Calif.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.
PUB DATE	75
CONTRACT	NE-0-00-3-0064
NOTE	273p.; For related documents, see SP 010 245 and 247 ; Not available in hard copy due to reproducibility of original
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Bids; Construction Costs; *Construction Programs; Consultants; Documentation; *Educational Development; *Educational Research; Federal Aid; Guidelines; *Laboratories; Program Evaluation; Research; *Technical Reports; Technical Writing

ABSTRACT

The working papers that document the planning, constructing, equipping, and operation of a laboratory facility dedicated to educational research and development (R&D) are organized into three volumes. Volume I sets forth the technical substance of the 12 working papers. This volume, Volume II, includes 35 technical attachments for Working Papers 2, 3, and 5 referred to in Volume I. The attachments for Working Paper 2 include criteria for program review, the contents of the grant application, a summary of space requirements, a list of outline specifications, staff reactions to architectural patterns, a notice of grant award, and an architect's agreement. Besides these and other technical papers, there are actual designs of classroom and building design. Attachments to Working Paper 3 include the architect's fee schedule, the architect's progress report, contract agreements with the construction contractors, and the contract with the consultant. The attachments for Working Paper 5 are construction manager's estimate of costs, architect's review of construction manager's cost, agreement of low bidder as to items included in the bid, and construction manager's analysis of cost saving resulting from construction management. (SK)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED126050

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SWRL

SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT

2

A LABORATORY FACILITY DEDICATED TO EDUCATIONAL R&D VOLUME II

Technical Attachments for Papers 1-5, Volume I

SWRL Working Papers: 1975

SP010 246

This document has been distributed to a limited audience for a limited purpose. It is not published. [redacted] SWRL Educational Research and Development, 4665 Lampson Avenue, Los Alamitos, California 90720. The work upon which this document is based was performed pursuant to Contract NE-0-00-3-0064 with the National Institute of Education. SWRL reports do not necessarily reflect the opinions or policies of the sponsors of SWRL R&D.

A LABORATORY FACILITY DEDICATED TO EDUCATIONAL R&D Volume II

Technical Attachments for Papers 1 - 5, Volume I

Edited by William H. Hein, Jr.

SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT
4665 Lampson Avenue, Los Alamitos, California 90720

BEST COPY AVAILABLE

PREFACE TO VOLUME II

The Working Papers documenting the planning, constructing, equipping, and operating of a laboratory facility dedicated to educational R&D are organized into three volumes. Volume I sets forth the technical substance of the 12 Working Papers; Volumes II and III contain the technical attachments to which reference is made throughout Volume I.

Volume II includes the technical attachments for Working Papers 1-5 in Volume I. Working Paper I describes the process followed by SWRL in planning the new facility, and the planning principles that were developed and followed during this process. The results of the planning are set forth in the form of descriptions of the special purpose, staff office, secretarial and working spaces that were included within the facility as well as their relationships to each other. The process followed in obtaining approval of the grant application is discussed in Working Paper 2. Included are the means utilized in complying with the authorizing legislation, regulations and agency guidelines. The materials utilized in both the program review and the technical review of the application resulting in the award of the grant are described.

Working Paper 3 sets forth the procedures followed in selecting the contractors and establishing their fees; the forms of contracts utilized; and the reporting relationships observed by SWRL, Government representatives and the contractors. Working Paper 4 reports SWRL's experience in applying the principles of construction management and fast-tracking. Also included are benefits resulting from the use of these techniques as well as suggested changes in the flow of decisions that should be incorporated into future projects of a similar nature. Working Paper 5 treats the process used by the construction manager in estimating costs, their verification by SWRL and the methods by which they can be used in establishing a construction budget.

CONTENTS

Attachments

WORKING PAPER 2

1 Criteria for Program Review

2 Board Authority to Submit Application

3 Contents of Prospectus for Program Review

4 Invitation to Apply for Grant

5 Contents of Grant Application

6 Summary of Space Requirements

7 Space Requirements Form

8 Schematics

9 Schematic Cartoon Sketches and Block Diagrams

10 Outline Specifications

11 Response to Consultant's Questions re Patterns

12 List of Patterns

13 Sample Patterns

14 Staff Reactions to Patterns

15 Additional Patterns from Staff

16 Architect's Reactions to Patterns

17 Consultant's Reactions to Schematics

18 Responses to Project Officer re Review of Application

19 Agenda for Review of Application

20 Notice of Grant Award

21 Architect's Agreement - Standard Form

22 Architect's Agreement - SWRL Project

Attachments

WORKING PAPER 3

23 Response to Project Officer's Questions regarding Architect and Construction Manager's Contracts

24 Architect's Fee Schedule

25 Architect's Progress Report

26 Contract with Construction Manager

27 Advertisement for Construction Bids

28 Approval for Award of Contract by Construction Manager

29 Contract with Construction Contractor

30 General Conditions - Construction Contracts

31 Contract with Consultant

WORKING PAPER 5

32 Construction Manager's Edtimate of Costs

33 Architect's Review of Construction Manager's Estimate of Costs

34 Agreement of Low Bidder as to Items Included in Bid

35 Construction Manager's Analysis of Cost Savings Resulting From Construction Management

Attachment 1. Criteria for Program Review

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

March 25, 1969

Dr. Richard Schutz, Director
Southwest Regional Laboratory
11300 LaCienega Boulevard
Inglewood, California 90306

Dear Dick:

Enclosed is a copy of the criteria that have been developed for the five year program review. The criteria have been reviewed by the National Advisory Committee and on the basis of their ideas a couple of additions will be made. We would appreciate specific imput from you on items you think should be added, deleted, or modified. Since we should mail this to the site visitors by April 1, please give me your comments as soon as possible.

I want to reinforce the idea of structuring the two day visit to insure that the visitors get the data they need to adequately cover the criteria. One idea suggested for starting the visit is the following: Begin with a brief general overview of the laboratory as it now exists and then take a project, say communication skills, and run it through the applicable criteria, e.g., II. A. 1. 2. 3., III. B. 1. a.b.c.d.e.f. and so on. In the afternoon and the next morning the team can split up and talk to people. Perhaps you could set up a schedule with options as you have done in the past. Then the final afternoon we can get together and talk about the laboratory's future plans. This is only a suggestion. If I have any brainstorms (ha, ha) I'll let you know. Please let me know your ideas on how we could structure the visit.

Sincerely,

Elinor

Elinor B. Kippnes
Program Associate
Division of Educational
Laboratories

Enclosure

CRITERIA FOR FIVE-YEAR PROGRAM REVIEW OF LABORATORIES

For Use by Visiting Teams

I. Importance of current development programs.

A. Is the laboratory working on the solution of one or more continuing or anticipated critical educational problems, particularly those with important social and/or economic consequences?

B. Do the strategies selected by the laboratory have potential for in fact providing a solution to the identified problems? Do they promise to have an impact on educational practice?

II. Likelihood of the laboratory's achieving both current and future program objectives.

A. Accomplishments of current program efforts.

1. Is there empirical evidence of the quality and effectiveness of the laboratory's developments to date?

2. Is their evidence that the laboratory has continually reevaluated its strategies and maintained, modified, or abandoned them for new approaches as necessary?

3. Are the laboratory's short-term accomplishments contributing to the realization of its long-term goals?

4. Are the accomplishments to date in reasonable relationship to the investment?

B. Planning competence.

1. Do current program plans reveal a sophisticated planning competence as indicated by:

a. clarity and specificity of objectives;

b. demonstration that viable alternative strategies were identified and weighed;

c. delineation of alternative approaches should current ones fail;

d. identification of activities that will have a cumulative effect on the educational problems identified;

e. specification of the time and resources necessary for the different stages of development;

f. provision for identifying the conditions necessary to achieve the outcomes postulated for the proposed solutions;

g. provision for assessing the costs of using the proposed solutions;

h. specification of development procedures to assure the continuous refinement of the products or processes under development against performance standards;

i. a diffusion strategy or provision for determining one.

2. Does the laboratory's long-range plan for the total institution:

a. present evidence that the laboratory has a clearly articulated mission;

b. contain projected programs concerned with critical education problems;

c. project strategies, organizational arrangements, and resource allocation that will facilitate the laboratory's mission.

3. Does the laboratory have effective mechanisms for internal review, planning, and decision-making, which involve staff, outside expertise, and its governing board?

C. Capability of staff.

1. Has the laboratory attracted a sufficient number of professional staff with diversified and complementary talents appropriate for the laboratory's programs?

2. Are there criteria and procedures for the selection of quality staff?

3. Is the staff able to work as teams in the solutions of problems?

D. Relationship to other agencies.

1. Is the laboratory utilizing the external, human resources from within or without the region which can contribute to the achievement of its goals?

2. Is there evidence that other agencies, particularly educational institutions, perceive the laboratory as contributing to the solution of important education problems? (e.g., willingness to participate in field tests, requests to participate in cooperative ventures, provision of financial support for the laboratory's programs.)

III. On the basis of your replies to the above questions, what is your overall judgment about the laboratory's eligibility for long-term commitment of support for program operation and facility needs?

Attachment 2. Board Authority to Submit Application

TO: BOARD OF DIRECTORS, SOUTHWEST REGIONAL LABORATORY

FROM: DIRECTOR OF SOUTHWEST REGIONAL LABORATORY

VIA: BUDGET AND FINANCE COMMITTEE

Communication No. 6
for consideration on November 19, 1968

SUBJECT: LABORATORY FACILITIES

A. Background

PL 89-10, Elementary and Secondary Education Act of 1965, authorized $100 million to be appropriated over a period of five fiscal years for the construction of regional facilities for research and related purposes. An appropriation of $30 million has been made for fiscal 1968-69. The Pittsburgh and Wisconsin R & D Centers are in the process of constructing facilities. The following Office of Education Event Schedule has evolved as a result of these initial efforts.

1. Site visit and program review directed to facility requirements.
2. Invitation to apply.
3. Preparation of application in accordance with Federal Regulations and Office of Education Guidelines.
4. Preparation of a preliminary schematic of floor layout and type of construction including basic construction budget.
5. Site visit and final review of documentation required for approval to initiate construction.

At the request of the Office of Education the information contained in Exhibit A was prepared.

B. **Proposal**

It is proposed that the Laboratory proceed to meet the Office of Education requirements to obtain financial support for the construction of Laboratory facilities consistent with the Site Criteria approved by the Board of Directors on March 22, 1966.

C. **Recommendation**

IT IS RECOMMENDED THAT: the Laboratory Director be authorized (1) to proceed with the necessary steps outlined by the Office of Education for the construction of a Laboratory facility consistent with Laboratory Site Criteria and (2) to prepare a preliminary application for Board approval.

Respectfully submitted,

Richard E. Schutz
Director
Southwest Regional Laboratory

Attachment 3. Contents of Prospectus for Program Review

CONTENTS

I. Program Status

Mission 1
Objectives 2
Documentation 10
Governance 11
Management Procedures 13
Personnel 15
Financial History 18
1969 Program Budget 19
Cost Projecting and Reporting Procedures 23
Accomplishments 24

II. Program Scenarios

Introduction 28
Curriculum Systems 33
Human Resource Utilization 38
Computer-Based Systems 43
Ecological Systems 56
Mission-Oriented Research 59

EXHIBITS

1. Mission Statement
2. SWRL Program Plan
3. Dimensions of Instructional Practice
4. Criteria for Evaluating an Educational Product
5. Current Product Components
6. Documentation Guidelines
7. Technical and Special Report Documentation
8. Joint Powers Agreement
9. Members of the Board of Directors
10. Sample Board of Directors' Meeting Agenda
11. Advisory Council Bylaws
12. Members of the Advisory Council
13. Sample Advisory Council Meeting Agenda
14. Guidelines for Preparing Project Specifications
15. Activity Prospectus Specifications
16. Sample Event Schedule
17. Staff Growth
18. Personnel List
19. Product Design Job Functions
20. Guidelines for Use of Consultants
21. Consultant List
22. Sample Cost-Projecting Computation Sheet
23. The World SWRL Lives In
24. Communication Skills Program Prospectus
25. Problem Solving Projects
26. Illustrative CMI Reports
27. Illustrative SPLAN Reports

Attachment 4. Invitation to Apply for Grant

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. [illegible]

May 22, 1969

Dr. Richard Schutz, Director
Southwest Regional Laboratory
11300 LaCienega Boulevard
Inglewood, California 90304

Dear Dr. Schutz:

I am pleased to inform you, as a result of the Five Year Program Review of the Southwest Regional Laboratory, that:

1. It is the intention of the U.S. Office of Education to provide support for the Laboratory for five years through fiscal year 1974 subject to the conditions described below.
2. The U.S. Office of Education extends an invitation to apply for education research facility construction funds under the Cooperative Research Act, as amended (Section IV, Title IV).

I would like to commend the laboratory for its continued progress. As an institution, SWRL has defined its mission as that of changing the nature of conventional instruction and developing a technology of instructional development. In the latter area, great strides have been made. The laboratory has not only conceptualized a systematic and replicable development process on the basis of its experience, but has demonstrated a remarkable sophistication in organizing its resources to implement the process. Products are being designed and developed in the area of Communication and Problem Solving Skills that promise to improve learning for young children and that serve as the basis along with Instructional Technology and Staff Training for the laboratory's effort to initiate changes in the nature of conventional instruction. The competence of the Board of Directors, the laboratory's management team and the professional staff, give the Office confidence that the laboratory will continue to produce programs of high quality.

We wish to make clear that, within the context of the U.S. Office of Education's intention to support the program of the Southwest Regional Laboratory for five years, year to year funding levels will be dependent upon not only the availability of appropriations but also a continued high level of performance.

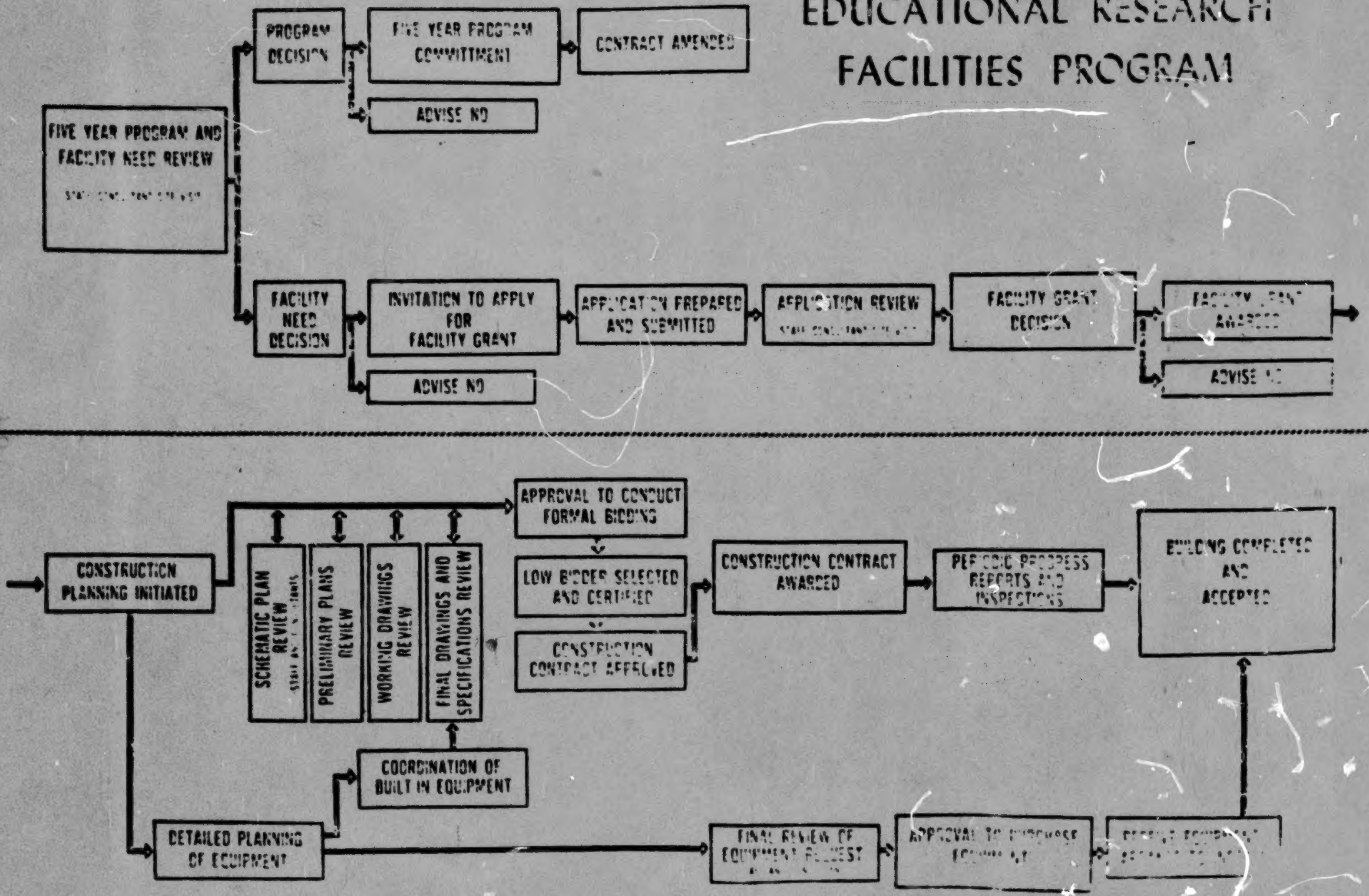
The application for an Educational Research Facilities Grant should follow the format described in the "Guidelines and Application Procedures". Any inquiries regarding your request for construction funds may be directed to Ernest W. Michelsen, Chief, Operations Staff, Division of Educational Laboratories.

Sincerely yours,

Norman J. Boyan

Norman J. Boyan
Associate Commissioner for Research

EDUCATIONAL RESEARCH FACILITIES PROGRAM


FIVE YEAR PROGRAM AND FACILITY NEED REVIEW
PROGRAM DECISION
FIVE YEAR PROGRAM COMMITTMENT
CONTRACT AMENDED
ADVISE NO
FACILITY NEED DECISION
INVITATION TO APPLY FOR FACILITY GRANT
ADVISE NO
APPLICATION PREPARED AND SUBMITTED
APPLICATION REVIEW
FACILITY GRANT DECISION
FACILITY GRANT AWARDED
ADVISE NO
CONSTRUCTION PLANNING INITIATED
SCHEMATIC PLAN REVIEW
PRELIMINARY PLANS REVIEW
WORKING DRAWINGS REVIEW
FINAL DRAWINGS AND SPECIFICATIONS REVIEW
COORDINATION OF BUILT IN EQUIPMENT
DETAILED PLANNING OF EQUIPMENT
APPROVAL TO CONDUCT FORMAL BIDDING
LOW BIDDER SELECTED AND CERTIFIED
CONSTRUCTION CONTRACT APPROVED
CONSTRUCTION CONTRACT AWARDED
PERIODIC PROGRESS REPORTS AND INSPECTIONS
BUILDING COMPLETED AND ACCEPTED
FINAL REVIEW OF EQUIPMENT REQUEST
APPROVAL TO PURCHASE EQUIPMENT

Attachment 5. Contents of Grant Application

CONTENTS

Page

Tital Page

Abstract 1

I. Justification of Grant Application 3

- A. Inadequacies of Present Facilities and Working Conditions 3
- B. The Laboratory Mission and Resulting Unique Facility Requirements 5
- C. Inter-Disciplinary and Inter-Organization Cooperative Relations. 16
- D. Major Source of Funding. 18
- E. Summary of Fifth Year Projections. 19

II. Program Statement. 20

- A. Mission and Objectives 20
- B. Accomplishments. 25
- C. Products 29
- D. Functions. 30
- E. Organization 30
- F. Present and Projected Program. 36

III. Program Budgets--Current and Projected 38

IV. Personnel Requirements--Current and Projected. 39

V. Functional Specifications (Educational Specifications) . . . 40

- A. Introduction and Planning History. 40
  - 1. Architectural Consultants. 40
  - 2. Design Consultants 42
  - 3. U. S. Office of Education. 45

Page

B. Implications for Building Design 48

1. Architectural Compatibility with Surroundings. . . . 48

2. Flexibility. 48

3. Electrical 48

4. Mechanical 49

5. Acoustics. 49

6. Media Systems. 49

7. Site Criteria and Site Search Documentation. . . . 49

C. Program Requirements 59

D. Tabulated Requirements for Each Space in Facility. . . . 60

E. Summary of Space Needs; Space Analysis for Total Facility 60

F. Fixed Equipment List 60

G. Movable Equipment. 60

H. Facilities Budget (Total Facilities Cost). 60

I. Estimated Construction Schedule. 61

J. Schematic Design and Outline Specifications. 61

VI. Lease Proposal 62

Attachment 6. Summary of Space Requirements

Summary of Requirements for Each Space

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
I. Management Support				
A. Laboratory Director's Office (1-man) (200 s.f.)	1	1	See Pattern #4 for Director's location. Space Requirements Form #1	200 Square Feet
B. Directo[illegible] [illegible]ference Room. [illegible] ("GG")		1	See Pattern #3 for Director's Conference Room. Space Requirements Form #2. Must be accessible from Laboratory Director's Office.	150 Square Feet
C. Directorate Office (1-man) (150 s.f.) ("GG")	5	5	See Pattern #4. Space Requirements Form #3.	750 Square Feet
D. Staff Office (120 s.f.) ("L")	(6)	(3)	See Pattern #3 for Circulation and Contact between the staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4 Should be on 2nd floor near Directors office.	360 Square Feet
E. Staff Office (1-man) (100 s.f.) ("J")	1 (2)	1 (2)	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #5. Should be located on 1st floor near reception and receiving areas.	300 Square Feet
F. Secretarial Space ("N")	5 (2)		See Pattern #6 for Researcher's Secretary. See Pattern #12 for Secretary Work Space. Space Requirements Form #5.	

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
G. Working Space for Technical ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7. Should be on 2nd floor near Director's office.	
H. Working Space for Office Assistants ("N")	5		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7. Should be located on 1st floor near receiving.	
I. Working Space for Personnel Assistant, Contract Assistant, and Accountant plus one assistant for each. ("N")	6		See Pattern #5 for Researcher's Work Space. Space Requirements Form #17. Should be located on 1st floor near reception and adjacent to Business Officer and Personnel Officers' offices.	
J. Working Space for Graduate Associates and Interns. ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7. Should be on 2nd floor near Director's Offices.	
II. Product Design (2nd floor)			Should be near Product Development.	
A. Division Head's Office (1-man) (150 s.f.) ("GG")	1	1	See Pattern #4 for Administrative Director's location. Space Requirements Form #3.	150 Square Feet
B. Staff Office (3-man) (180 s.f.) ("Y")	18	6	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #8.	1,080 Square Feet

	Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
C.	Staff Office (2-man) (150 s.f.) ("GG")	4	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #9.	300 Square Feet
D.	Staff Office (2-man) (120 s.f.) ("L")	8	4	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4.	480 Square Feet
E.	Staff Office (1-man) (120 s.f.) ("L")	2	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4 with equipment list in Space Requirements Form #5.	240 Square Feet
F.	Staff Office (1-man) (100 s.f.) ("J")	5 (8)	5 (8)	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #5.	1,300 Square Feet
G.	Working Space for Technicians. ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
H.	Secretarial Space. ("M")	7 (4)		See Pattern #6 for Researcher's Secretary. See Pattern #12 for Secretary's Work Space. Space Requirements Form #5.	
I.	Working Space for Graduate Associates and Interns. ("N")	7		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
III. Product Development (2nd floor)			Should be new Product Development.	
A. Division Head's Office (1-man) (150 s.f.) ("GG")	1	1	See Pattern #4 for Administrative Director's location. Space Requirements Form #3.	150 Square Feet
B. Staff Office (3-man) (180 s.f.) ("N")	36	12	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #8.	2,160 Square Feet
C. Staff Office (2-man) (150 s.f.) ("GG")	4	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #9.	300 Square Feet
D. Staff Office (2-man) (120 s.f.) ("L")	24	12	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4.	1,440 Square Feet
E. Staff Office (1-man) (120 s.f.) ("L")	2	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4 with equipment list in Space Requirements Form #5.	240 Square Feet

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
F. Staff Office (1-man) (100 s.f.) ("J")	8 (15)	8 (15)	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #5.	2,300 Square Feet
G. Working Space for Technicians ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
H. Secretarial Space ("N")	17(5)		See Pattern #6 for Researchers' Secretary. See Pattern #12 for Secretary's Work Space. Space Requirements Form #5.	
I. Working Space for Graduate Associates and Interns. ("N")	7		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
IV. Product Integration (2nd Floor)			Should be near Product Development.	
A. Division Head's Office (1-man) (150 s.f.) ("GG")			See Pattern #4 for Administrative Director's location. Space Requirements Form #3.	150 Square Feet.
B. Staff Office (3-man) (180 s.f.) ("N")	36	12	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #8.	2,160 Square Feet

	Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
C.	Staff Office (1-man) (150 s.f.) ("GG")	4	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #9.	300 Square Feet
D.	Staff Office (2-man) (120 s.f.) ("L")	22	11	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Envirnment for Researchers. Space Requirements Form #4.	1,320 Square Feet
E.	Staff Office (1-man) (120 s.f.) ("J")	2	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4 with equipment list in Space Requirements Form #5.	240 Square Feet
F.	Staff Office (1-man) (100 s.f.) ("J")	5 (15)	5 (15)	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #5.	2,000 Square Feet
G.	Working Space for Technicians ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
H.	Computer Space	8		Space Requirements Form #10.	2,000 Square Feet
I.	Secretarial Space ("M")	18 (5)		See Pattern #6 for Researcher's Secretary. See Pattern #12 for Secretary's Work Space. Space Requirements Form #5.	

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
J. Working Space for Graduate Associates and Interns. ("N")	7		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
V. Resource Service (1st floor)			Should be on 1st floor near production, audio visual, reception, shops and conference areas.	
A. Division Head's Office (1-man) (150 s.f.) ("GG")	1	1	See Pattern #4 for Administrative Director's location. Space Requirements Form #3.	150 Square Feet
B. Staff Office (3-man) (180 s.f.) ("N")	15	5	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #8.	900 Square Feet
C. Staff Office (2-man) (150 s.f.) ("GG")	4	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #9.	300 Square Feet
D. Staff Office (2-man) (120 s.f.) ("L")	4	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4.	240 Square Feet
E. Staff Office (1-man) (120 s.f.) ("J")	2	2	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #4 with equipment list in Space Requirements Form #5.	240 Square Feet

	Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
F.	Staff Office (1-man) (100 s.f.) ("J")	3 (5)	3 (5)	See Pattern #3 for Circulation and Contact between staff. See Pattern #5 for Environment for Researchers. Space Requirements Form #5.	800 Square Feet
G.	Secretarial Space ("M")	10 (4)		See Pattern #6 for Researcher's Secretary. See Pattern #12 for Secretary's Work Space. Space Requirements Form #5.	
H.	Working Space for Graduate Associates and Interns. ("N")	2		See Pattern #5 for Researcher's Work Space. Space Requirements Form #7.	
I.	Design Studio ("Y")	10		See Pattern #7 Production. Space Requirements Form #11.	1,100 Square Feet
J.	Print Shop ("V")	11		See Pattern #7 Production. Space Requirements Form #12.	1,950 Square Feet
K.	Shipping and Receiving ("T")	1		See Pattern #7 for Receiving location. Space Requirements Form #13.	1,600 Square Feet
L.	Audio Visual (T.V. Recording Studio) ("R")	3		Space Requirements Form #14.	1,300 Square Feet
M.	Photo Lab ("W")			Space Requirements Form #15.	300 Square Feet

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
N. Library ("FF")	2		See Pattern #13 for Library. Space Requirements Form #16.	3,200 Square Feet
O. Reception Area ("H")	2		See Pattern #3 for Circulation and Contact between staff. Space Requirements Form #17.	3,200 Square Feet
P. Conference Room ("EE")			See Pattern #6 for Conference Room. See Pattern #3 for Seminar Room. Space Requirements Form #18.	2,800 Square Feet
Q. Student Reception ("B")			See Pattern #1 for Children's Reception Space. See Pattern #2 for Child's world - Adult World Connection. See Pattern #19 for Sitting and Entrance. Space Requirements Form #19.	1,000 Square Feet
R. Learning Labs ("C,F&E")			See Pattern #2 for Control Room for Testing Area. Space Requirements Form 20.	1,800 Square Feet
S. Simulated Classrooms ("A")			See Pattern #1 for Child's World. See Pattern #9 for Sitting and Entrances Space Requirements Form #21	2,850 Square Feet
T. Electronic Shop ("S")	1		Space Requirements Form #22	300 Square Feet
U. Paint Shop (A.V. Prep) ("P")			Space Requirements Form #23	300 Square Feet

Space	Number of People	Number of Rooms	Description of Functions, Special Considerations, and Furnishings	Net Assignable Area
V. Wood/Metal Shop ("O")	1		Space Requirements Form #24	300 Square Feet
W. Materials Assembly ("Q")	6		Space Requirements Form #25	1,100 Square Feet
X. Print Shop Storage ("V")			Space Requirements Form #25	600 Square Feet
Y. Audio Visual Storage ("U")			Space Requirements Form #26	650 Square Feet
Z. Multi-Purpose Meeting Area ("I")			Space Requirements Form #27	3,200 Square Feet

Attachment 7. Space Requirements Form

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT

SPACE REQUIREMENTS

#4

Skidmore, Owings & Merrill, Architects

ROOM NAME 2 man professional staff office ROOM NO. "L" - 120 square feet
TYPE OF SPACE 2 man office staff NO. OF IDENTICAL SPACES 64
AREA ______ MINIMUM CLEAR CEILING HEIGHT 9' FT.

1. ACOUSTICAL:

a. If noisy, describe noise and/or vibration producing equipment ______

b. Vibration isolation from other areas require: Yes ______ No X
If yes describe function requiring isolation ______

2. AUDIO-VISUAL and COMMUNICATIONS:

a. Chalkboards required: Yes see equipment No ______: If yes ______ lin. ft. required.
b. Tackboards required: Yes ______ No X : If yes ______ lin. ft. required.
c. Blackout required: Yes ______ No X
d. Projector sound outlets required: Yes ______ No X
e. TV outlets required: Yes ______ No X : If yes, TV monitor required: Yes ______ No ______: TV Camera pick-up required: Yes ______ No X
f. Telephone outlets required: Yes X No ______: If yes, single line outlet required: Yes X No ______: Call Director (central station) required: Yes ______ No X
g. Intercom outlets required: Yes ______ No X : If yes, answer station required: Yes ______ No X : Master station: Yes ______ No X
h. Speaker system with microphone required: Yes ______ No X
i. Other requirements: Yes ______ No X : If yes, describe ______

j. Television viewing from central source required: Yes ____ No X ____

3. BUILT-IN FURNITURE: (COUNTERS, WALL HUNG CABINETS, ETC)

Quantity	Type & Size
	None

Quantity	Type & Size

a. Built-In storage required: Yes ____ No X ____: If yes, describe quantity, weight and dimensions of items to be stored ____

b. Other requirements: Yes ____ No X ____: If yes, describe ____

4. EQUIPMENT: See Attached Form.

ELECTRICAL:

a. Normal power outlets are 120 volts, 1 phase, 1.5 amps per outlet (16 amps per circuit). Electric outlets required beyond this: Yes ____ No X ____: If Yes, describe ____

b. Direct current required: Yes ____ No X ____

c. Variable voltage required: Yes+ ____ No X ____

d. Regulated voltage required: Yes ____ No X ____

e. Equipment grounding required: Yes ____ No X ____

f. Electric shielding required: Yes ____ No X ____

g. Lighting in general will be flourescent with levels recommended by the Illuminating Engineers Society. Special lighting required: Yes ____ No X ____: If yes, describe ____

6. PLUMBING:

a. Cold water at sinks required: Yes__________ No X

b. Hot water at sinks required: Yes__________ No X

c. Hose connections to water outlets (wall or bench) required: Yes__________ No X

d. Normal water outlets are 1/2" valves. Water outlets required beyond this: Yes__________ No X : If yes, dexcribe,__________

e. Other plumbing services required (washing up facilities etc). If yes, describe__________

7. HEATING and VENTILATING:

a. Controlled environment required: Yes__________ No X : If yes __________ °F __________ °F at__________ %RH __________ %RH.

b. Special exhausts for hazardous or noxious fumes required: Yes__________ No X If yes, describe nature of fumes:__________ at__________ CFM.

c. Other heating and ventilating requirements: Yes__________ No X : If yes, describe:__________

8. HEALTH and SAFETY:

a. Hazardous and/or noxious fumes and/or materials apparent: Yes__________ No X : If yes, describe__________

b. Other hazardous conditions apparent: Yes__________ No X : If Yes, describe:__________

9. STRUCTURAL: In general, floor loads will be in accordance with the building code requirements for the specific use, Heavy, concentrated loads required: Yes__________ No X : If yes, describe__________

10. If questionnaire omits space for any special considerations, describe below (e.g. moveable partitions at class rooms, other flexibility requirements filing requirements) Side partitions can be fixed; end partitions should be movable. Should be carpeted.

PREPARED BY: W.H. Hein, Jr. DATE: 9/1/69

EQUIPMENT LIST SKIDMORE, OWINGS & MERRILL, ARCHITECTS

ROOM NAME 2 man professional staff office ROOM NO. "L" NO. OF IDENTICAL SPACES 64

NO. *	DESCRIPTION (SIZE, MODEL NO., WEIGHT)	NEW	USE	DISSIPATED HEAT LOAD	DIVERSITY 2	SERVICE		
						Power	Cold Water	Oth
2	Staff desks 28" X 60"					2		
2	Staff typewriters							
2	Staff chairs							
2	4-drawer filing cabinets							
2	Chalkboards							
2	Small bookcases							

PREPARED BY W.H. Hein, Jr. DATE: 9/1/69

(1) Presently Owned
(2) Minutes Used Per Hour at Peak Use
*Figures shown are per office.

SUMMARY OF
SPACE AND ROOM REQUIREMENTS
ON MOVE-IN DATE

A. Assignable

1. **Experimental**

Learning Labs and Control Rooms	1,440 s.f.
Simulated Classrooms	2,850
Computer Area	2,800
Student Reception	1,000

2. **Production**

Audio Visual Studio	1,300 s.f.
Photo Lab	300
Materials Assembly	1,100
Electronic Shop	300
Wood-Metal Shop	300
Audio Visual Preparation	300
Print Shop	1,950
Design Studio	1,100

3. **Staff and General Services**

Offices 112	16,850 s.f.
Conference Rooms	2,800
Display, Reception	3,200
Multi-Purpose Meeting Area	3,200
Kitchen	350
Library	3,200
Storage	1,800
Shipping and Receiving	1,600
Work Space	9,800
Secretarial	1,850
Total Assignable	59,390 s.f.

B. Gross

Total Gross 86,400 s.f.

C. Efficiency

$$\frac{59{,}390 \text{ s.f.}}{86{,}400} = 69\%$$

SUMMARY OF
SPACE AND ROOM REQUIREMENTS
1973-74

A. Assignable

1. Experimental

Learning Labs and Control Rooms	1,440 s.f.
Simulated Classrooms	2,850
Computer Area	2,800
Student Reception	1,000

2. Production

Audio Visual Studio	1,300 s.f.
Photo Lab	300
Materials Assembly	1,100
Electronic Shop	300
Wood-Metal Shop	300
Audio Visual Preparation	300
Print Shop	1,950
Design Studio	1,100

3. Staff and General Services

Offices 160	21,710 s.f.
Conference Rooms	2,800
Display, Reception	3,200
Multi-Purpose Meeting Area	3,200
Kitchen	350
Library	3,200
Storage	1,800
Shipping and Receiving	1,600
Work Space	4,940
Secretarial	1,850
Total Assignable	59,390 s.f.

B. Gross

Total Gross	86,400 s.f.

C. Efficiency

$$\frac{59,390 \text{ s.f.}}{86,400} = 69\%$$

SUMMARY OF
SPACE AND ROOM REQUIREMENTS
1973-74
BY DIVISION

Product Design

Size--Square Feet	Number	Number of Staff to be Housed
180 (3 man)	6	18
150 (1 man)	1	1
150 (2 man)	2	4
120 (2 man)	4	8
120 (1 man)	2*	2
100 (1 man)	13**	13
Technical (working areas)		2
Secretarial (secretarial areas)		11
Graduate Associates and Interns (working area)		7
	TOTAL	66

*2 Junior Management
**1 Junior Management and 12 MPS

Product Development

Size--Square Feet	Number	Number of Staff to be Housed
180 (3 man)	12	36
150 (1 man)	1	1
150 (2 man)	2	4
120 (2 man)	12	24
120 (1 man)	2*	2
100 (1 man)	23**	23
Technical (working areas)		2
Secretarial (secretarial areas)		22
Graduate Associates and Interns (working area)		7
	TOTAL	121

*2 Junior Management
**3 Junior Management and 20 MPS

Product Integration

Size--Square Feet	Number	Number of Staff to be Housed
180 (3 man)	12	36
150 (1 man)	1	1
150 (2 man)	2	4
120 (2 man)	11	22
120 (1 man)	2*	2
100 (1 man)	20**	20
Technical (working areas)		2
Technical (computer area)		8
Secretarial (secretarial areas)		23
Graduate Associates and Interns (working area)		7
	TOTAL	125

*2 Junior Management
**2 Junior Management and 18 MPS

Resource Service

Size--Square Feet	Number	Number of Staff to be Housed
180 (3 man)	5	15
150 (1 man)	1	1
150 (2 man)	2	4
120 (2 man)	2	4
120 (1 man)	2*	2
100 (1 man)	8**	8
Technical (production areas)		29
Secretarial (secretarial area)		16
Graduate Associates and Interns (working area)		2
	TOTAL	81

*2 Junior Management
**8 MPS

Management Support

Size--Square Feet	Number	Number of Staff to be Housed
200 (1 man)	1	1 (Director)
180 (3 man)	-	-
150 (1 man)	5*	5
150 (2 man)	-	-
120 (2 man)	3	6
120 (1 man)	-	-
100 (1 man)	3**	3
Technical (working area)		2
Secretarial (secretarial and working areas)		18***
Graduate Associates and Interns (working area)		2
TOTAL		37

*5 Senior Management

**Business Officer, Personnel Officer, and 1 Junior Management

***7 secretaries will work in secretarial space, 5 office assistants will work in work space; Personnel Assistant, Contract Assistant, and Accountant plus one assistant for each (all classified secretarial) will work in working space

Size--Square Feet	Design	Develop.	Integr.	R.S.	M.S.	Total Offices	Staff
200	-	-	-	-	1	1	1
180 (3)	6	12	12	5	-	35	105
150 (1)	1	1	1	1	5	9	9
150 (2)	2	2	2	2	-	8	16
120 (2)	4	12	11	2	3	32	64
120 (1)	2	2	2	2	-	8	8
100 (1)	13	23	20	8	3	67	67
Secretarial	11	22	23	16	18	-	90
Technical	2	2	10	29	2	-	45
Grad. Assoc.	7	7	7	2	2	-	25
Staff Accommodated	66	121	125	81	37		430

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT

SPACE REQUIREMENTS

#10

Skidmore, Owings & Merrill, Architects

ROOM NAME Computer ROOM NO. 2800 square feet
TYPE OF SPACE DD NO. OF IDENTICAL SPACES 1
AREA ______ MINIMUM CLEAR CEILING HEIGHT 9 FT.

1. ACOUSTICAL:

   a. If noisy, describe noise and/or vibration producing equipment ______
   Vibration low. Computer, tape drive, optical scanner have rather low sound; line printer and teletype are loud.

   b. Vibration isolation from other areas require: Yes ______ No X
   If yes describe function requiring isolation ______

2. AUDIO-VISUAL and COMMUNICATIONS:

   a. Chalkboards required: Yes X No ______: If yes ______ lin. ft. required.

   b. Tackboards required: Yes X No ______: If yes ______ lin. ft. required.

   c. Blackout required: Yes ______ No ______

   d. Projector sound outlets required: Yes ______ No ______

   e. TV outlets required: Yes ______ No ______: If yes, TV monitor required: Yes ______ No ______: TV Camera pick-up required: Yes ______ No ______

   f. Telephone outlets required: Yes X No ______: If yes, single line outlet required: Yes X No ______: Call Director (central station) required: Yes ______ No ______

   g. Intercom outlets required: Yes ______ No X: If yes, answer station required: Yes ______ No ______: Master station: Yes ______ No ______

   h. Speaker system with microphone required: Yes ______ No X

   i. Other requirements: Yes ______ No X: If yes, describe ______

j. Television viewing from central source required: Yes No X

3. BUILT-IN FURNITURE: (COUNTERS, WALL HUNG CABINETS, ETC)

Quantity	Type & Size

Quantity	Type & Size

a. Built-In storage required: Yes No X : If yes, describe quantity, weight and dimensions of items to be stored

b. Other requirements: Yes No X : If yes, describe

4. EQUIPMENT: See Attached Form.

5. ELECTRICAL:

a. Normal power outlets are 120 volts, 1 phase, 1.5 amps per outlet (16 amps per circuit). Electric outlets required beyond this: Yes X No : If Yes, describe Clean voltage through a buffer transformer ground wire to each outlet, 2-30 Amp receptacles.
b. Direct current required: Yes No X
c. Variable voltage required: Yes+ No X
d. Regulated voltage required: Yes No X
e. Equipment grounding required: Yes X No
f. Electric shielding required: Yes X No
g. Lighting in general will be flourescent with levels recommended by the Illuminating Engineers Society. Special lighting required: Yes X No : If yes, describe 120 foot candles

6. PLUMBING:

a. Cold water at sinks required: Yes ____ No X ____

b. Hot water at sinks required: Yes ____ No X ____

c. Hose connections to water outlets (wall or bench) required: Yes ____ No X ____

d. Normal water outlets are 1/2" valves. Water outlets required beyond this: Yes ____ No X ____: If yes, dexcribe, ____

e. Other plumbing services required (washing up facilities etc). If yes, describe ____

7. HEATING and VENTILATING:

a. Controlled environment required: Yes X ____ No ____: If yes ____ °F ____ °F at ____ %RH ____ %RH.

b. Special exhausts for hazardous or noxious fumes required: Yes ____ No X ____ If yes, describe nature of fumes: ____ at ____ CFM.

c. Other heating and ventilating requirements: Yes ____ No ____: If yes, describe: ____

8. HEALTH and SAFETY:

a. Hazardous and/or noxious fumes and/or materials apparent: Yes ____ No X ____: If yes, describe ____

b. Other hazardous conditions apparent: Yes ____ No X ____: If Yes, describe: ____

9. STRUCTURAL: In general, floor loads will be in accordance with the building code requirements for the specific use, Heavy, concentrated loads required: Yes ____ No X ____: If yes, describe ____

10. If questionnaire omits space for any special considerations, describe below (e.g. moveable partitions at class rooms, other flexibility requirements filing requirements) ____

PREPARED BY: ____ DATE: ____

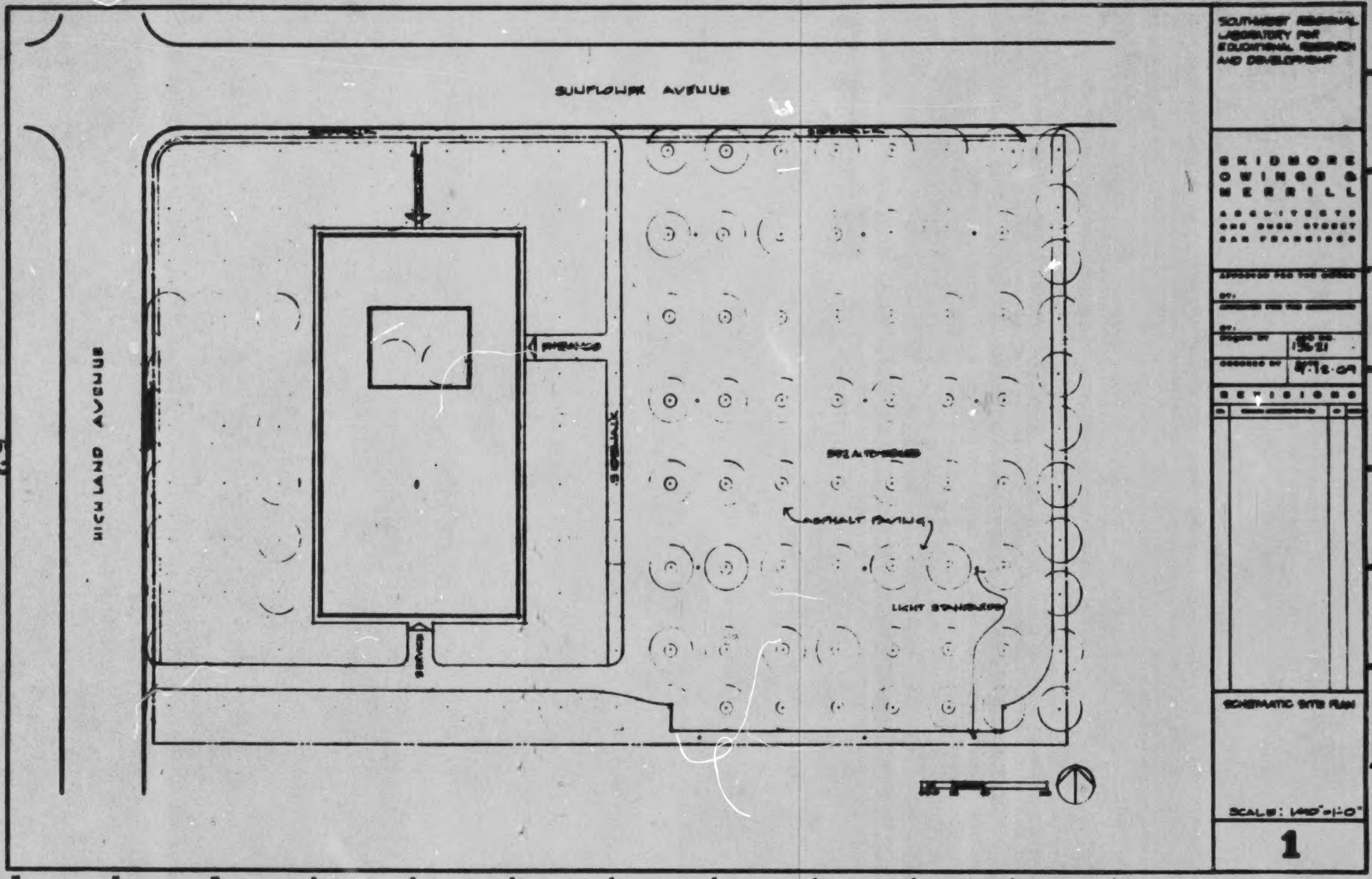
Subject: DATA PROCESSING SPACE REQUIREMENTS

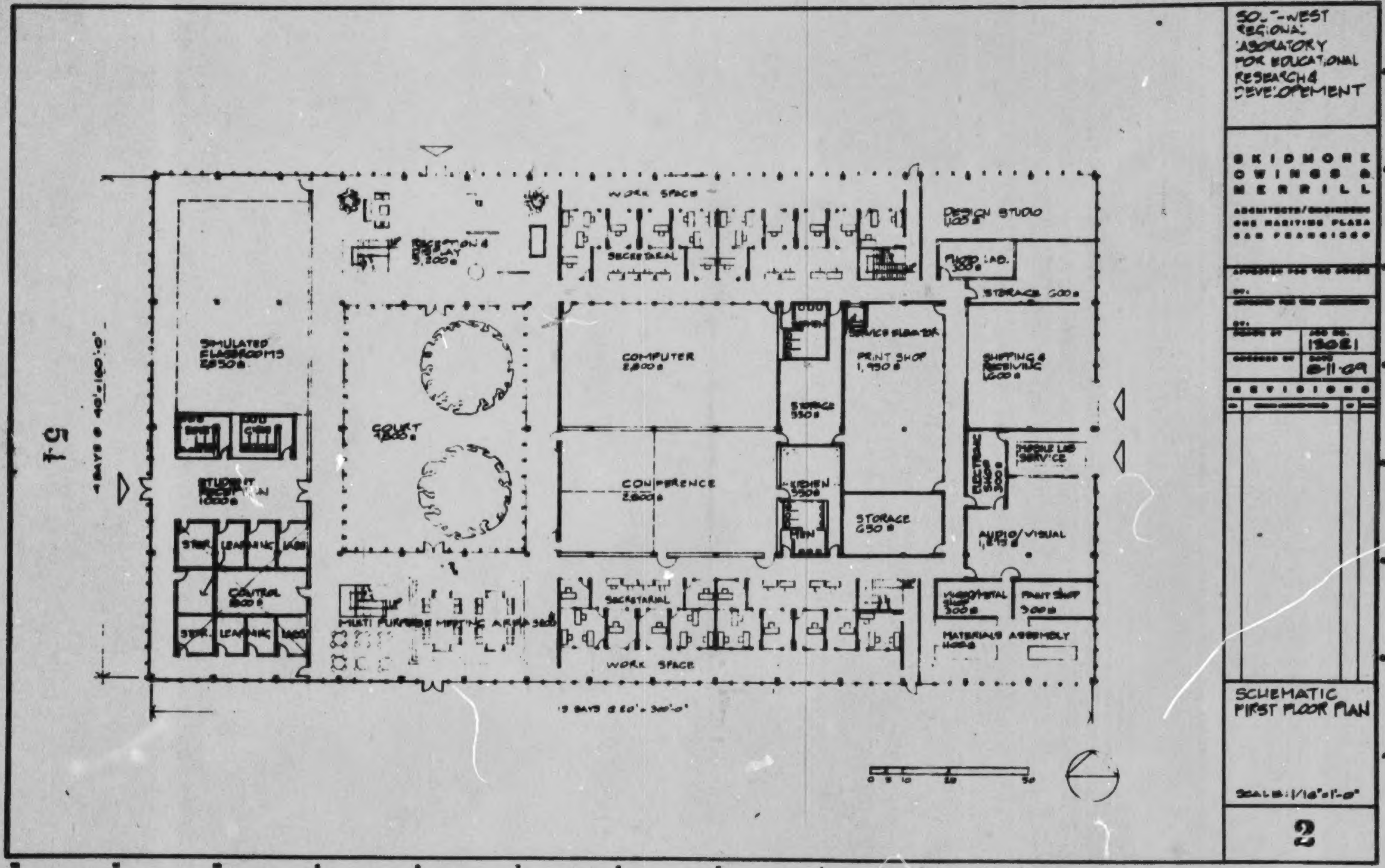
Quantity	Item	Approx. Sq. Ft.
1	Data Concentrator Configuration includes:	1600
	1 CPU	
	2 Tape drives	
	1 CRT/keyboard	
	1 cord reader	
	1 line printer	
	1 teleprinter	
	1 work table	
	1 keypunch w/side desk	
1	Optical Scanner Configuration	150
	1 optical scanner	
	1 tape drive	
	1 forms and tape storage cabinet	
	1 work table	
	2 chairs	
1	Time-Sharing Configuration	150
	3 teleprinters	
	2 work tables	
	1 bookcase	
	3 chairs	

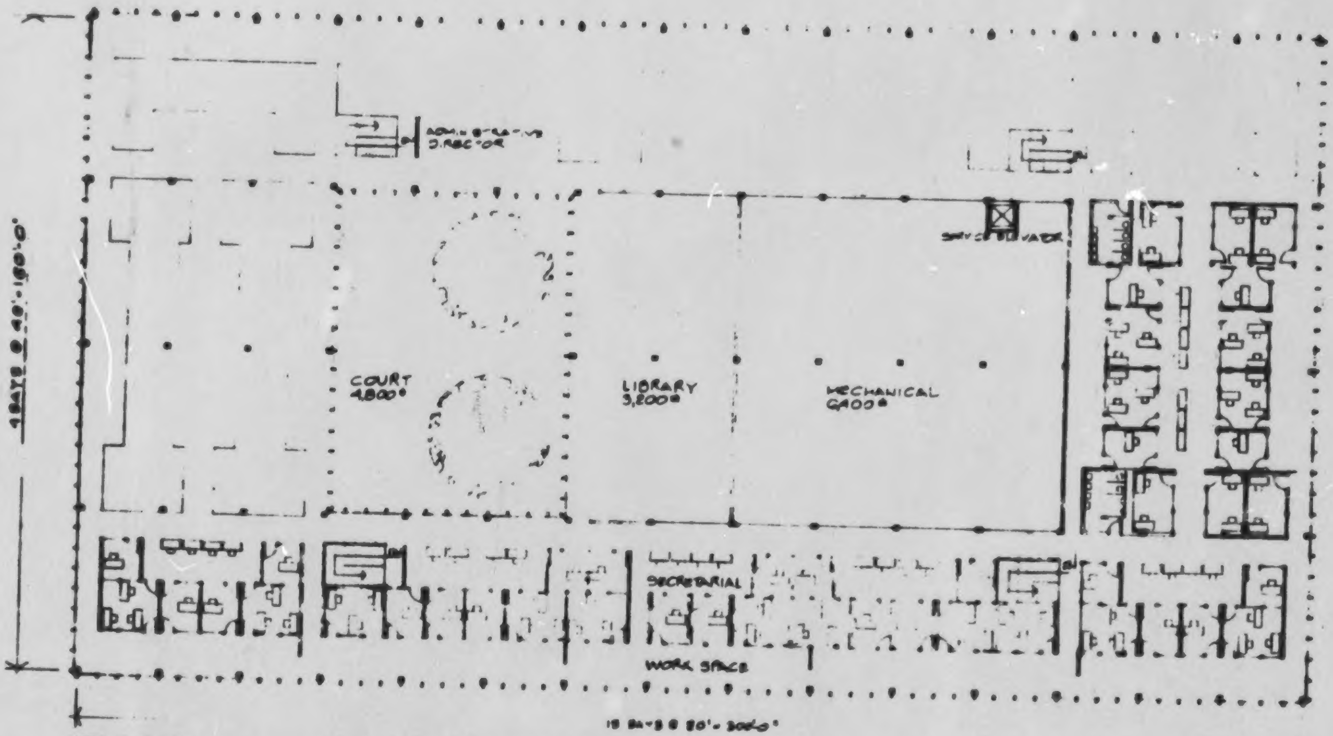
Quantity	Item	Approx. Sq. Ft.
	Computer Room Accessories	
	10 20 drawer card files	300
	1 form storage cabinet	20
	1 card storage cabinet	20
	1 tape storage cabinet	20
	2 misc. storage cabinet	40
	1 truck	6
	2 work tables w/chairs	75
	2 desks w/chairs & bookcases	130
	storage room for data processing supplies	200
		1011
	Data Processing Library for texts, reference materials, etc.	100
	3 bookcases	
	1 table	
	2 chairs	

Approximate Total Sq. Ft. = 2800

Attachment 8. Schematics


SUNFLOWER AVENUE
HIGHLAND AVENUE
SIDEWALK
SIDEWALK
SIDEWALK
ENTRANCE
ENTRANCE
SERVICES
392 AUTOMOBILES
ASPHALT PAVING
LIGHT STANDARDS
SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT
SKIDMORE OWINGS & MERRILL
ARCHITECTS
ONE MAIDEN STREET
SAN FRANCISCO
APPROVED FOR THE OWNER
BY:
APPROVED FOR THE ARCHITECTS
BY:
DRAWN BY
JOB NO. 1521
CHECKED BY
DATE 4-18-69
REVISIONS
SCHEMATIC SITE PLAN
SCALE: 1/40" = 1'-0"
1


SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPEMENT
SKIDMORE OWINGS & MERRILL
ARCHITECTS/ENGINEERS
ONE MARITIME PLAZA
SAN FRANCISCO
JOB NO. 13081
DATE 8-11-69
REVISIONS
SCHEMATIC FIRST FLOOR PLAN
SCALE: 1/16"=1'-0"
2
SIMULATED CLASSROOMS 2850 ☐
STUDENT RECEPTION 1000 ☐
STOR.
LEARNING
CONTROL 800 ☐
RECEPTION & DISPLAY 3,300 ☐
COURT 4200 ☐
MULTI PURPOSE MEETING AREA 3600
WORK SPACE
SECRETARIAL
COMPUTER 2,800 ☐
CONFERENCE 2,800 ☐
STORAGE 330 ☐
KITCHEN 330 ☐
MEN
SERVICE ELEVATOR
PRINT SHOP 1,930 ☐
STORAGE 650 ☐
DESIGN STUDIO 1100 ☐
PHOTO LAB. 300 ☐
STORAGE 500 ☐
SHIPPING & RECEIVING 1600 ☐
ELECTRONIC SHOP 300 ☐
MOBILE LAB SERVICE
AUDIO/VISUAL 1,213 ☐
WOOD/METAL SHOP 300 ☐
PAINT SHOP 300 ☐
MATERIALS ASSEMBLY 1080
4 BAYS @ 40'=160'-0"
13 BAYS @ 20'=300'-0"
0 5 10 20 50



ADMINISTRATIVE DIRECTOR
COURT 4,800#
LIBRARY 3,200#
MECHANICAL 6,400#
SERVICE ELEVATOR
SECRETARIAL
WORK SPACE
4 BAYS @ 40' = 160'-0"
15 BAYS @ 20' = 300'-0"

	OFFICE TYPE:	1 MAN (160#)	1 MAN (120#)	2 MAN (150#)	1 MAN (90#)	TOTALS	
2ND FLOOR	NUMBER OF EACH	18	30	12	30	90	OFFICES
	NO. OF RESEARCHERS	18	30	24	90	102	RESEARCHERS
1ST FLOOR	NUMBER OF EACH	6	10		8	24	OFFICES
	NO. OF RESEARCHERS	6	10		24	40	RESEARCHERS
	TOTAL SECRETARIAL ON BOTH FLOORS:					70	SECRETARIES
	TECHNICAL STAFF					25	TECHNICAL STAFF
						307	TOTAL BUILDING POPULATION

SOUTHWEST
REGIONAL
LABORATORY
FOR EDUCATIONAL
RESEARCH &
DEVELOPEMENT

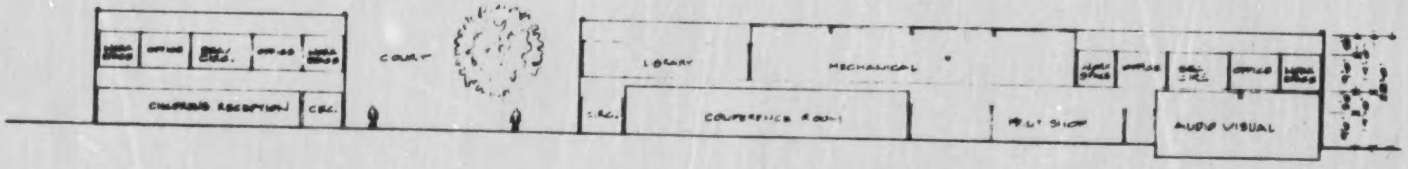
SKIDMORE
OWINGS &
MERRILL
ARCHITECTS/ENGINEERS
ONE MARITIME PLAZA
SAN FRANCISCO

APPROVED FOR THE OWNER
BY:
APPROVED FOR THE ARCHITECTS
BY:
DRAWN BY
JOB NO. 15021
CHECKED BY
DATE 8·11·69
REVISIONS

SCHEMATIC
SECOND FLOOR PLAN

SCALE: 1/16" = 1'-0"

3


CHILDREN'S RECEPTION
CIRC.
OFFICE
COURT
LIBRARY
CIRC.
CONFERENCE ROOM
MECHANICAL
PRINT SHOP
OFFICE
OFFICE
AUDIO VISUAL

0 5 10 25 50

SOUTHWEST
REGIONAL
LABORATORY
FOR EDUCATIONAL
RESEARCH &
DEVELOPEMENT

SKIDMORE
OWINGS &
MERRILL
ARCHITECTS/ENGINEERS
ONE MARITIME PLAZA
SAN FRANCISCO

APPROVED FOR THE OWNER
BY:
APPROVED FOR THE ARCHITECT
BY:
DRAWN BY
JOB NO. 1321
CHECKED BY
DATE 9·1869
REVISIONS

SCHEMATIC
SECTION

SCALE: 1/16" 1'-0"

4

Attachment 9. Schematic Cartoon Sketches and Block Diagrams

JOB MEMORANDUM

Job: Southwest Regional Laboratory

Memo No: 4

Date: February 25, 1969

Subject: Meeting at SWRL
February 20, 1969

Present:
Richard Schutz SWRL
Bill Hein

Henry Segerstrom

John Woodbridge SOM
Doug Merrill
James Alcorn

The meeting was held to present four schematic cartoon schemes which had been developed by the architects. Each scheme was complimented by an accompanying site plan and expansion diagram.

Site problems regarding expansion, orientation, and parking count were discussed.

It was generally agreed that the best location for the complex is on the westerly portion of the site. This will free the easterly portion for more efficient parking layout.

It was also agreed that expansion would most economically occur on one side of the structure rather than on two sides as was indicated on site plan 'C'.

Plan layout was discussed at great length and a second set of plans was left with SWRL to be marked up with all comments and suggestions by their people. These comments will be sent to SOM during the week of February 24th.

Plan 'C' which groupsthe conference and student areas, separates the production area, and locates the main bulk of the offices on the second floor, was generally accepted as being the most convenient and efficient breakdown of functions.

Distribution: R. Schutz, B. Hein, J. Woodbridge, D. Merrill, J. Alcorn

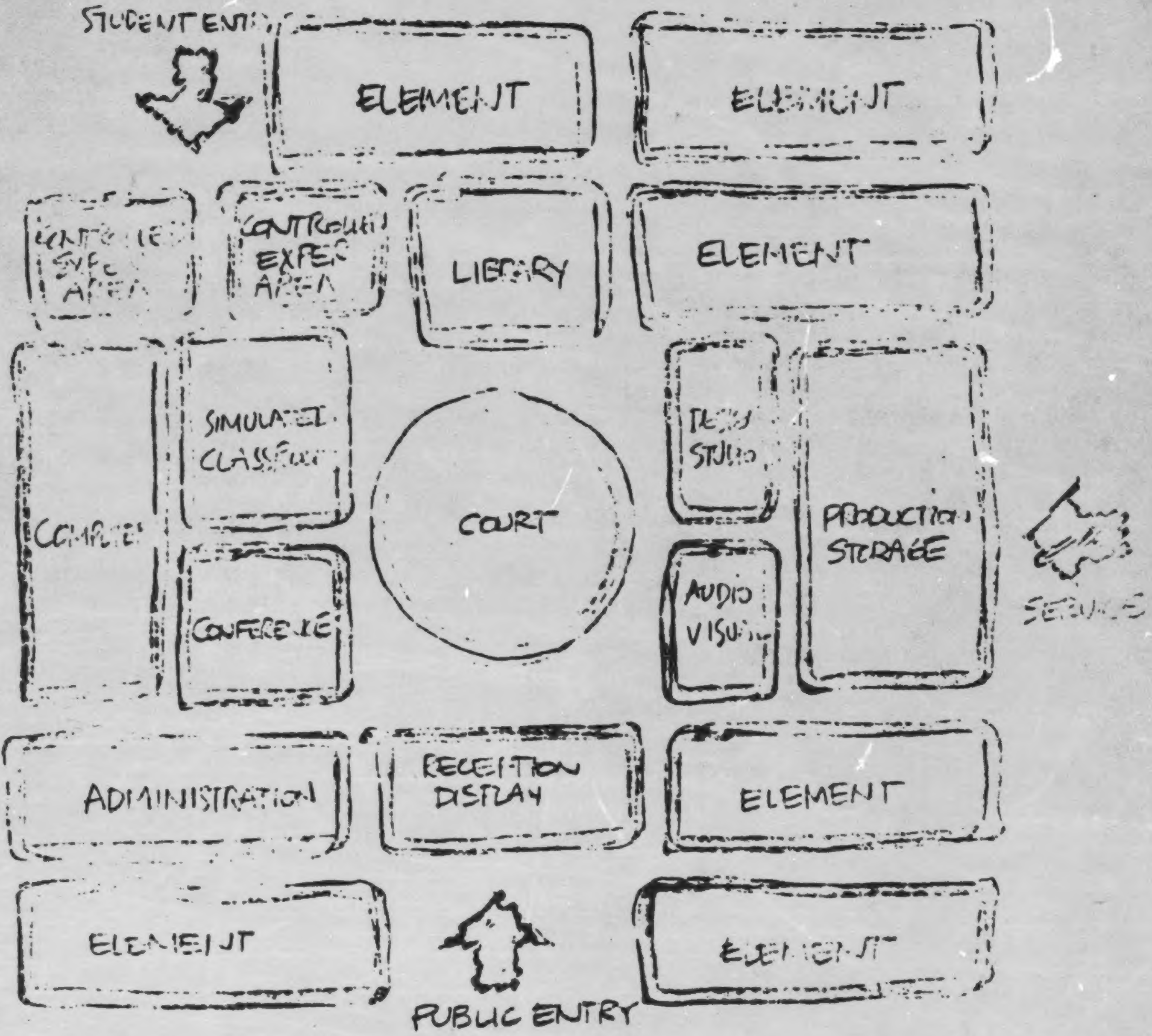
SOM will investigate expansion plans in more detail.

The proposal which has been made by the Center for Environmental Structure was discussed by John Woodbridge. A meeting with SOM, SWRL and the Center for Environmental Structure is being arranged for the week of March 3rd. A copy of "A PATTERN LANGUAGE WHICH GENERATES MULTI-SERVICE CENTERS" by Alexander, Ishikawa and Silverstein is being sent to SWRL.

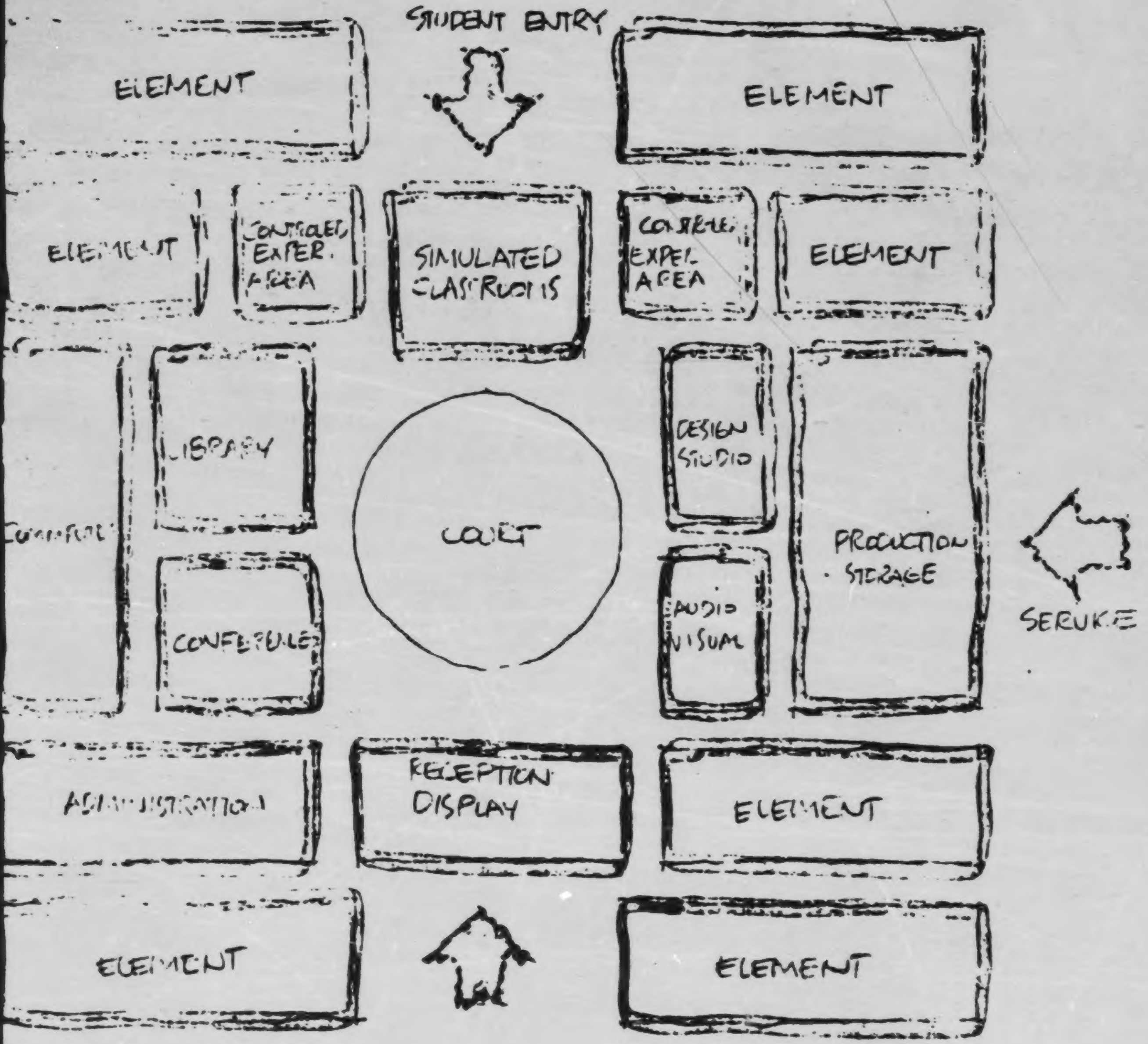
James Alcorn

JA/bv

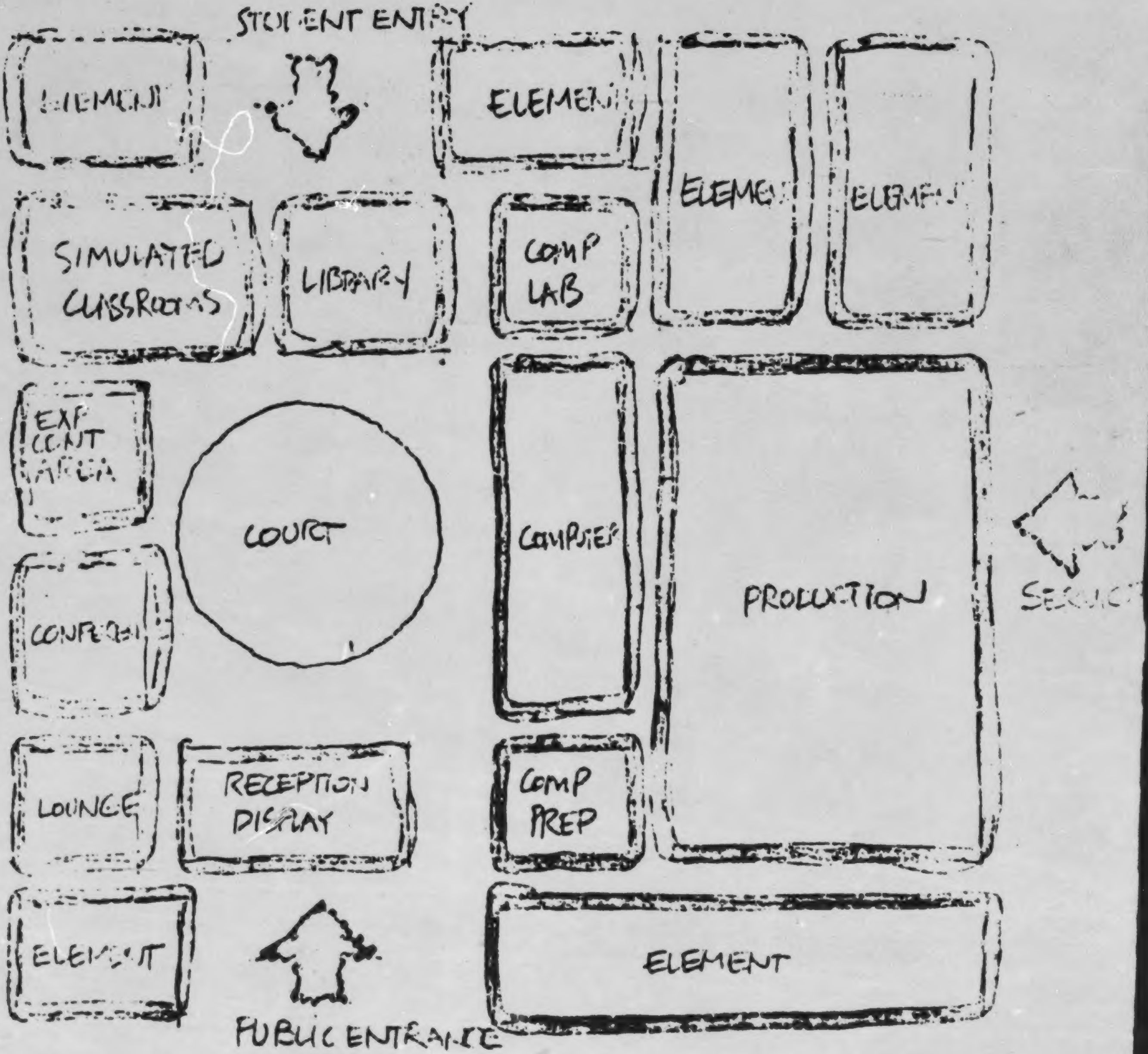
RECEIVED
FEB [illegible] 1969


STUDENT ENTRY
ELEMENT
ELEMENT
CONTROLLED EXPER AREA
CONTROLLED EXPER AREA
LIBRARY
ELEMENT
COMPUTER
SIMULATED CLASSROOM
CONFERENCE
COURT
STUDIO
AUDIO VISUAL
PRODUCTION STORAGE
SERVICE
ADMINISTRATION
RECEPTION DISPLAY
ELEMENT
ELEMENT
ELEMENT
PUBLIC ENTRY

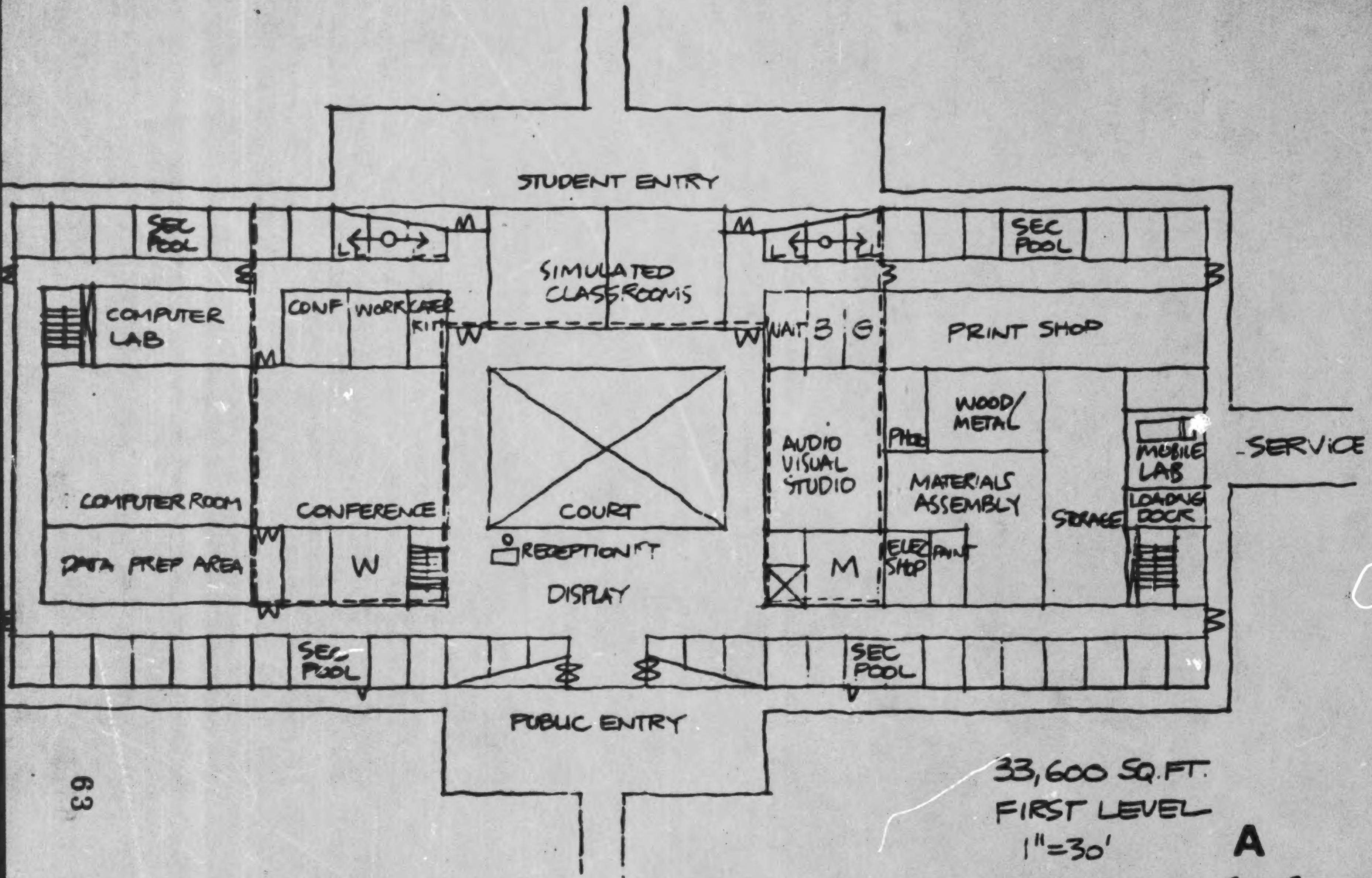
RELATIONSHIP DIAGRAM


STUDENT ENTRY
ELEMENT
ELEMENT
ELEMENT
CONTROLLED EXPER. AREA
SIMULATED CLASSROOMS
CONTROLLED EXPER. AREA
ELEMENT
COMMUNI
LIBRARY
COURT
DESIGN STUDIO
PRODUCTION STORAGE
SERVICE
CONFERENCE
AUDIO VISUAL
ADMINISTRATION
RECEPTION DISPLAY
ELEMENT
ELEMENT
ELEMENT

RELATIONSHIP DIAGRAM


STUDENT ENTRY
ELEMENT
ELEMENT
ELEMENT
ELEMENT
SIMULATED CLASSROOMS
LIBRARY
COMP LAB
EXP CONT AREA
COURT
COMPUTER
PRODUCTION
SERVIC
CONFERENCE
LOUNGE
RECEPTION DISPLAY
COMP PREP
ELEMENT
ELEMENT
PUBLIC ENTRANCE

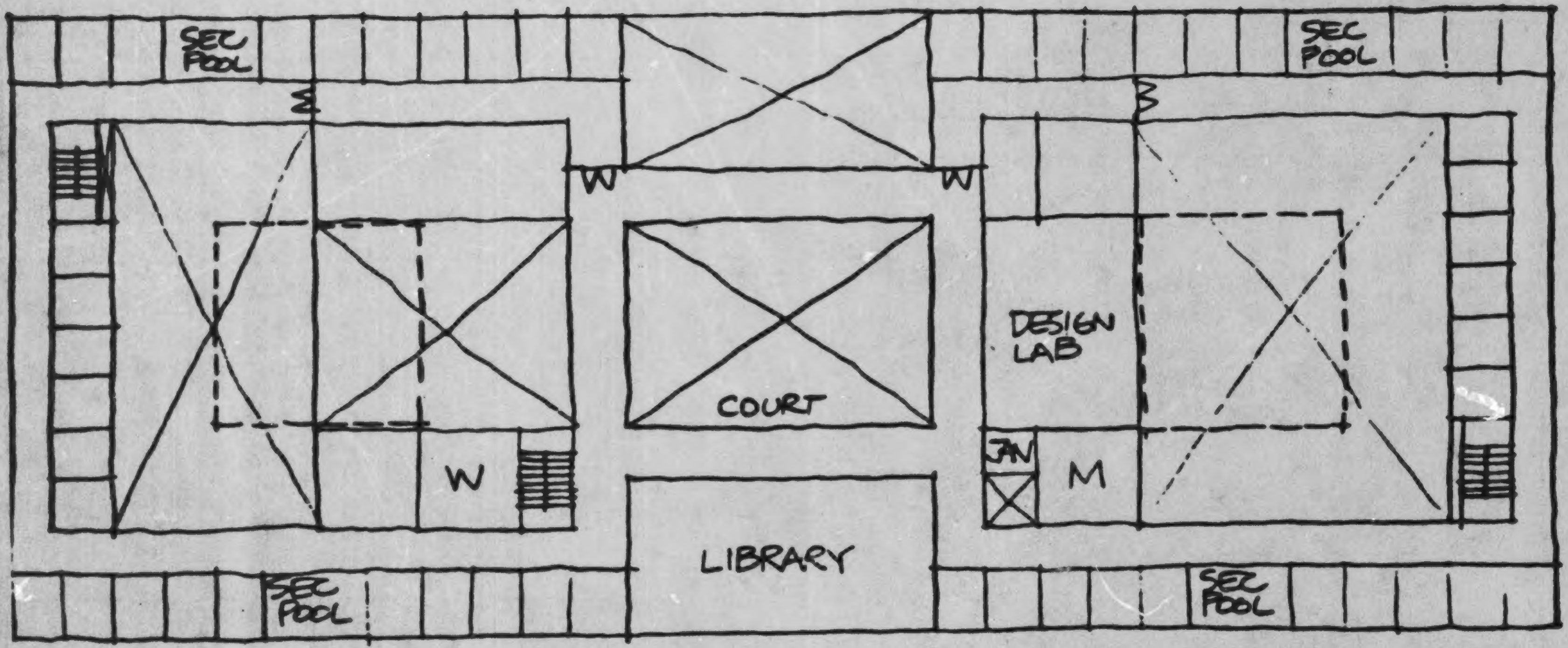
RELATIONSHIP DIAGRAM


STUDENT ENTRY
SEC POOL
SEC POOL
SIMULATED CLASSROOMS
COMPUTER LAB
CONF
WORK
CATER KIT
W
M
WAT
3
G
PRINT SHOP
WOOD/METAL
PHOTO
AUDIO VISUAL STUDIO
COURT
RECEPTION
DISPLAY
COMPUTER ROOM
CONFERENCE
DATA PREP AREA
W
M
MATERIALS ASSEMBLY
STORAGE
MOBILE LAB
LOADING DOCK
ELEC SHOP
PAINT
SERVICE
SEC POOL
SEC POOL
PUBLIC ENTRY

33,600 SQ.FT.
FIRST LEVEL
1"=30'

A

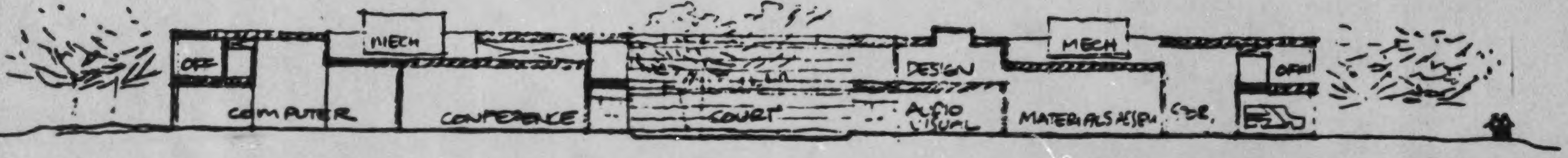
BUILDING GROSS = 55,800 SQ.FT
2·20·69


SEC POOL
SEC POOL
DESIGN LAB
COURT
W
W
W
W
W
M
JAN
LIBRARY
SEC POOL
SEC POOL

SECOND LEVEL
22,200 SQ. FT.

A

2.20.64


OFF
COMPUTER
MECH
CONFERENCE
COURT
DESIGN
AUDIO VISUAL
MECH
MATERIALS RESCH
COR.
OFF

SECTION
1"=30'
A

2.20.69

Attachment 10. Outline Specifications

September 15, 1969

SOUTHWEST REGIONAL LABORATORY

OUTLINE SPECIFICATIONS: BUILDING SHELL & SITE WORK

ARCHITECTURAL

EXTERIOR WALL:	Metal curtain wall with plate glass.
PAVING:	Parking lot to have asphaltic paving, sidewalks to be exposed aggregate paving.
STAIRS:	Welded steel.
ELEVATOR:	Service elevator, hydraulic plunger type.
TOILET ROOMS:	Full height tile walls, plaster ceilings, tile floors, miscellaneous: ceiling hung partitions, all necessary toilet room accessories, plumbing and light fixtures.
MECHANICAL ROOMS:	Double stud acoustical walls.

STRUCTURAL

STRUCTURAL FRAME:	Steel frame.
1st FLOOR:	Slab on grade.
2nd FLOOR:	Metal deck with light weight topping. Floating slab at mechanical room.
ROOF:	Metal deck with insulation.
FOOTINGS:	Spread footings.

MECHANICAL

Building to be air conditioned

ELECTRICAL:

BUILDING SERVICES:	Power, telephone and signal services complete with main switchboard. KWH meter feeders and raceways to tenant's distribution panels and terminal cabinets on each floor, including connections to existing underground service facilities.
EXTERIOR LIGHTING:	And parking lot lighting including panel board, circuitry and controls.

OUTLINE SPECIFICATION: IMPROVEMENTS

ARCHITECTURAL

INTERIOR MATERIALS AND FINISHES:

OFFICE AREAS:	Fixed partitions to be painted gypsum board over metal studs. Partitions at offices to be moveable. Partitions between offices and perimeter work space to be glass in metal frame. Floors to be carpeted. Ceilings to be suspended acoustical panel.
RECEPTION, DISPLAY & LOUNGE:	Panelled walls. Floor to be quarry tile with carpeting at seating areas. Ceiling to be plaster.
STUDENT AREA:	Fixed partitions to be painted gypsum board over metal studs. Simulated class room area to have moveable and operable partitions as necessary for flexibility.
PRODUCTION & SERVICE AREAS:	Partitions to be painted gypsum board over metal studs (walls of computer and print rooms at corridors to be glazed). Floors at computer room and design studio to be vinyl asbestos tile, other to be smooth concrete. Ceilings at

computer room, design studio, print shop & audio-visual to be suspended acoustical panel, other areas to have no ceiling.

LIBRARY: Wood panelled walls, carpeted floor, suspended acoustical panel ceiling.

CONFERENCE RM: Perimeter walls to be wood panelling. Room to be provided with operable dividers. Floor to be carpeted. Ceiling to be suspended acoustical tile.

KITCHEN: Walls to be vinyl covered gypsum board, floor to be vinyl asbestos tile, ceiling to be suspended acoustical panel.

DOORS: Wood solid core, painted, metal frames.

SUN CONTROL: Vertical blinds.

ACOUSTICAL WALLS: Print shop and audio-visual studio to have double stud, insulated acoustical walls adjoining corridors or occupied spaces.

ELECTRICAL

LIGHT FIXTURES

SECOND FLOOR: Flush, lensed, air handling flourescent, one per 5' module type

FIRST FLOOR: Flush, lensed, air handling flourescent, one per module. Typical except as indicated below.

RECEPTION, DISPLAY & LOUNGE: Recessed incandescent.
PRINT SHOP, WORK SHOPS & SHIPPING/RECEIVING: Suspended flourescent.
STORAGE: Surface mounted incandescent.
AUDIO-VISUAL: Special Lighting.

OUTLINE SPECIFICATION: TENANT IMPROVEMENTS

MECHANICAL

Building to be fully air conditioned. System to be flexible to accommodate rearrangement of offices and class rooms.

ELECTRICAL

1. Power distribution panels, branch circuit panels and feeders, branch circuits and power outlets. Outlets will be served with branch circuit conduits and outlets on an individual basis, no central raceway system will be provided in floors.
2. Lighting fixtures, outlets, branch circuits and control devices. Lighting levels shall be as recommended by Illuminating Engineering Society.
3. Telephone terminal cabinets, raceway system and outlets on individual basis as described for power.
4. Complete signal systems, including fire alarm.
5. Raceway system with outlets for tenant's audio-visual equipment.

LANDSCAPING

PLANTING: Trees and ground cover

IRIGATION: As required.

Attachment 11. Response to Consultant's Questions re Patterns

SWRL SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT
11300 LA CIENEGA BOULEVARD · INGLEWOOD, CALIFORNIA 90304 · TELEPHONE 776-3800 AREA CODE 213

April 15, 1969

Miss Barbara Schreiner
Center for Environmental Structure
2531 Etna Street
Berkeley, California 94704

Dear Barbara:

I am enclosing the answers to the questions in your letter. We hope that with this information, you will be able to draw up and furnish us a schedule of the steps necessary to complete the work set forth in the proposal.

We are looking forward to going over some of the suggested patterns at our next meeting. It would be helpful if we had some representative ones before this meeting.

If I can be of further help, let me know.

Sincerely,

William H. Hein, Jr

William H. Hein, Jr.
Assistant Director-Business

WHHJr:in
Enclosure

cc: Mr. James Alcorn
Mr. Doug Merrill
Dr. Richard Schutz
Mr. John Woodbridge
SWRL Program Council

ILLUSTRATOR'S SPACE

1. Does each illustrator work directly with the research staff and carry the project through by himself?

   No. Production manager works with research staff. He then works with lead artist or with individual artists. All contacts are made by production manager or his designee.

2. How many illustrators are there? Do they all generally perform the same tasks? What are their spatial requirements? For example, do any jobs require more than one work bench?

   Four. Yes, tasks are similar, although there are some specialities. Each requires a drawing board, a standard table, and a tabaret. Space requirements are approximately 8' x 8' for each.

3. Are conferences with consultants, SWRL research staff, or others most comfortably held "over the drawing boards", or is there a need for a small seminar or conference space?

   Conferences are between artist and production manager. Therefore, manager needs an adequate office. Artists do not need conference space. Also, need small room for viewing and screening audio visual.

4. Do some persons require offices or private workspaces? Please indicate why such spaces may be necessary.

   Need one darkroom for several purposes: a) for screening--see No. 3 above, b) photo typositor, c) varitype headlines machine, and d) lucygraph. Room should be approximately 12' x 14'.

5. Please indicate whether any equipment has special spatial or mechanical requirements. For example, is water close at hand necessary? Do you need special ventilation or 220 volt outlets, etc.?

   Stat camera needs 30 amp, 110v outlet; dry mount machine needs 30 amp, 110v outlet. Room described in No. 4 above needs to be well ventilated. Also, the temperature needs to remain at 71°F. A Stat camera is to be placed in small room and would need to be well ventilated. Need many double recepticles, at least one at each art station.

6. What type and how large a storage space is necessary?

Current storage space is adequate for current program.

7. What kind of expansion is foreseen for illustrator's workspace?

Difficult to determine. Expansion depends directly on total Laboratory program.

MOBILE VAN

1. Describe how, when, and for what purpose mobile vans are used.

See attached article from "In the SWRL."

2. What sort of equipment is moved to and from the van? Please describe equipment in terms of weight and size.

Two video tape recorders, each 30" x 20" x 16" and 70 pounds. Psychological testing equipment (varies, but 36" x 24" x 24", eight 60 pounds). Tripods (30" base). Television cameras, directional microphones, lamp holders, monitors, audio tape recorders, mixers, switches. Could be larger pieces in future (equipment rack 6' x 2' x 1½') weight 150 pounds.

3. How large is each van and how many does SWRL have?

SWRL has one van at present. The dimensions are contained in the attached diagram.

4. What kind of expansion is anticipated in the use of mobile vans?

A maximum of three mobile vans is anticipated over the next five years.

5. What kind of storage space is required near the mobile vans? Would equipment be more secure if stored in the garage storage space than in the van itself?

Mobile Lab should be stored inside. Locked storage space near Mobile Lab storage space is desired. 6' high, 3' deep, 20' long.

6. Who drives and maintains responsibility for mobile vans?

The mobile vans are so designed that any staff member may drive them. Educational Resource Service has responsibility for maintenance and scheduling of the mobile van.

7. When equipment is removed from the van where is it placed and who is charged with the responsibility for storage and/or maintenance?

Richard Hoskin (Audio Visual and Instrumentation) is responsible for storage and maintenance in the Audio Visual space. Mobile Labs will be refitted as necessary to meet requirements of new tryouts.

8. Should mobile vans be included in a typical visitors tour of SWRL?

Yes.

COMPUTER FACILITY

1. Please describe the size of equipment anticipated including ancillery equipment such as keypunch, etc.

Dr. Reineck has given us the floor plans which are enclosed.

2. Who shall have access to these facilities?

The director of computer operations, the machine operator, the senior systems analyst, and occasionally the programmers. Perhaps eight different people will get near the computer from time to time, but we hope to limit the normal number to two.

3. Are work spaces required in this room? If so, for what purpose will they be used?

Yes, working space is required for writing and correcting programs, for consulting on error messages, and for analyzing printouts.

4. What are some of the more specific mechanical requirements?

Air conditioning should keep room at 68° to 72°. Electrical requirements for peripheral equipment are modest and can be satisfied by 220v wiring.

5. What type of expansion requirements are anticipated for these facilities?

None for the immediate future. However, we may add peripheral equipment in the intermediate future, but the nature of this equipment has not yet been defined.

AUDIO VISUAL

1. Indicate the type and size of spaces required by this section? For example, storage, mechanical equipment shop, electronic equipment shop, locked storage, bench spaces.

Engineering room with space for two desks, a drawing board, and electronic test area. Machine shop with tool room lathe, milling machine, band saw, sanding and grinding equipment, and bench saw. Equipment storage room (locked) 6' x 3' x 20'--three of these.

2. While testing equipment, is there a need for a sound studio or sound proofing?

Yes, a sound studio for making master audio recordings (10' x 10'). Audio booth for placement of recorders--should be 10' x 15'.

3. Please describe the extent and nature of productions produced by SWRL, which might provide data and requirements for a studio.

SWRL will need a complete television production studio. (35' x 35' with a minimum of 10' ceiling, preferably higher)

4. If a studio is required, what physical elements are essential? Include such elements as sound proofing, observation windows, cable troughs, etc.

Observation windows required plus no rugs on floor but should be quiet area, not close to anything noisy. Should be able to make good sound recordings there. Need control booth for television studio, might be combined sound booth. Also need storage area for sets.

5. In what other parts of the SWRL building might audio visual equipment be used? Please indicate all possible uses regardless of how minor.

Auditorium (rear-screen projection desired) (testing facilities instrumentation will be required). Closed circuit to auditorium or conference room.

6. Are there special mechanical or electrical needs? For example 220 voltage, etc.?

   Large electrical services (100 amp just for television studio 220 - 50 amp service for machine room).

7. Are there any safety hazards which can best be resolved by providing special physical arrangements? For example some parts of the shop should not be near the entrance?

   Television studio should be separate from shop areas, thus removing shop areas as hazards for visitors, especially children. Also removes noise. Engineering room and machine shop should be close proximity--but away from television studio.

8. Is there a need for private work spaces for some persons; for example is one person charged with the responsibility for paper work, etc.?

   Office would be in engineering room. If script writers, etc. are to be housed in this area, then we need two offices also.

9. Are conferences with consultants, or lab researchers, held in the audio visual section? Are these casual? Do they deal with setting up programs, or what? Finally, how often might such conferences, casual or otherwise take place?

   Conference normally in office of research staff.

10. What are the anticipated expansion requirements of this section of the lab?

   Depends on total Laboratory program.

PRINT SHOP

1. Describe the interaction between the print shop staff, and other departments at SWRL. Please list the interaction between other departments in order of frequency and provide a description of why interaction with one department is more important than another.

   Interaction is between Production Manager or his designee and individual members of research staff. Interaction to date has been more frequent with Product Development Element because of the nature of their function. This will probably continue to be the case.

2. Describe the sequence of the production process for the more typical types of jobs.

   Typically, an approved order is received by Production Manager from initiating Element. Manager then assigns appropriate art work, if any. Production Coordinator then assigns appropriate reproduction functions, either in-house or out-house.

3. List print shop personnel in terms of the production sequence, where every facet of the print shop is utilized. For each person listed, please provide a one sentence job description.

   a. Manager, Production Services--responsible for all art and print shop activities.

   b. Production Coordinator--assigns art and typography to job; approves final job.

   c. Print Shop Supervisor--inspects, approves, and assigns job to plate maker.

   d. Plate Maker--with Itek platemaker produces necessary plates for duplication.

   e. Pressman--prints job per instructions.

   f. Bindery--collates, binds, stitches, trims, and inventories job per instructions.

4. For each job description listed above, indicate the type and nature of the physical work space required to perform this job. For example, some persons may require enclosed work spaces; while others, by the nature of their work, skills and longevity, may only require bench or desk space.

   a. Manager's office

   b. Desk space only

   c. Supervisor's office

   d. open space

   e. open space

   f. open space

5. Indicate what part of the production sequence, which is by nature of the equipment used, classified as noisy.

   The pressman and bindery sequence.

6. If the print shop were to be physically segmented into separate rooms, at what point of the production sequence would such separation be most easily made and why?

   The bindery sequence could be separate.

7. In terms of the most comprehensive production sequence, indicate the number of square feet required for each operation.

   Current space at SWRL-Century is adequate for present equipment and functions (approximately 3,000 square feet for art and reproduction).

8. Is shipping and mailing under the direction of the print shop director? If not, to what extent is mailing and shipping a part of the production sequence?

   Under the control of Production Coordinator. It is an important part of production sequence but the functions of the Production Coordinator and Print Shop Supervisor are both under the control of the Production Manager.

9. Are darkroom facilities necessary? If so how large should it be?

   No facilities necessary.

10. Does the print shop director, or management, at SWRL, encourage the use of any print shop facilities by non-print shop staff? For example, do people help themselves to the use of any equipment, facilities or products of the print shop?

    Absolutely not.

11. Does the print shop have night shifts either presently or in the future? If night work is a possibility, should the print shop staff have access to the entire building? If not, what parts should be open?

    The Print Shop does not have a night shift at present. However, night work in the future is a possibility. The Print Shop staff would not need access to the entire building but only to the Print Shop itself, storage, and shipping spaces.

12. In terms of the most comprehensive production sequence, please describe the storage space necessary at each point along this sequence.

Depends on total Laboratory program. Present storage space is adequate for current needs. However, if inventory needs to be increased (Communication Skills, Staff Training, etc.), storage space would need to be increased.

13. What are the special mechanical requirements of the print shop? For example, do you need special washroom facilities, electrical outlets for 220 voltage, additional or special ventilation, etc.?

Yes, all are needed. Washup facilities and drainage are currently needed. Special outlets and ventilation will be needed.

SITE

1. Can we distinguish between an educational area in the proposed facility, i.e. research and experiments involving children at SWRL itself; and a non-educational area, not involving children at SWRL?

Yes.

2. If we do distinguish such a child area, are there reasons for placing it in a separate building? For example, a building with a special environment of its own? Classrooms with many windows, leading outside to areas to be used for experiments in life sciences? And beyond that to an outside environment for testing outdoor equipment and programs?

There are no special reasons for placing the child area in a separate building.

3. What are the requirements of the child area, other than "classrooms"? Should the child area include, for example, a number of offices and other facilities for staff who are most concerned with testing programs?

The Field Act of the State of California requires special construction relating to fire and earthquake in any areas in which there will be children in the Laboratory. Therefore, the conference room and controlled experimental areas should be located in the child area. The architects have advised that Field Act requirements can be met in a single building. There is no need for office space for staff within the child area.

4. What research requirements can be defined for this set of staff?

Since there will be no special staff located in the child area, there is no special research requirements. The staff as a whole will be utilizing the research facilities.

5. Who are the staff most concerned with working with children on site at SWRL? Does SWRL propose to affiliate with the University of California at Irvine? Would an affiliation with UCI alter the requirements of the child area in any way?

The Product Design staff's mission is to identify, analyze, and make explicit conceptual language and information-procession skills which are relevant to successful instruction to Laboratory products. This staff will be the most concerned with working with children in the small controlled experimental areas.

Product Development's mission is to specify instructional outcomes for the Laboratory's instructional products and to develop the methods and materials for achieving them. This staff will probably be most concerned with working with children in the simulated classrooms.

SWRL does not propose to affiliate with the University of California at Irvine.

6. What is the estimated number of staff who will work in the child area per day?

Five to ten.

7. What is the estimated maximum number of children who will be in the child area at any given time?

Thirty.

CLASSROOMS

7a. There is a growing body of evidence indicating that the classroom environment is a critical factor in the learning process - for example, requirements for "active learning" laid down by the Nuffield Foundation Mathematics Project: which environmental factors are considered important by SWRL, or have been tested by SWRL as part of a research program? For example:

a. Floor area
b. Walls
c. Ceiling height
d. Furniture
e. Furniture distribution
f. Doors
g. Windows
h. Lighting
i. Acoustics
j. Temperature
k. Humidity
l. Plants and animals
m. Outdoor cognitive learning

While all of these environmental factors are considered important by SWRL, none have been tested as part of a research program.

8. Has SWRL published any reports or articles that relate to any of these factors and their relation to learning? (Give details.)

   No.

9. Might SWRL propose a research program at a future date that would relate to these factors?

   Yes.

10. Which of these factors should be constant, and which variable, in the completed building?

    All should be variable.

11. Is there a list available of all the current and projected research programs being undertaken by SWRL - programs that specifically relate to the proposed child area?

    The Contractor's Request for Continued Funding, dated September 15, 1968, is the most current list. A copy has been previously furnished.

STAFF ATTRACTION AND RETENTION

1. If SWRL competes for retention and attraction of staff with the academic environments, which part of the academic environment can be simulated in SWRL; e.g. which staff members should have freedom to come and go without being watched?

   Members of the Professional Staff and above.

GENERAL QUESTIONS

1. As the research teams finish their projects is there any way they can "advertize" their achievements? If not, is this desired and if so, what form of presentation would be most appropriate, e.g. meetings, bulletins?

   As research teams complete their reports, they may "advertise" in professional journals. The results of projects are also publicized by the Laboratory in research memoranda.

2. Do visiting speakers come at lunch times?

   No, but they could.

3. Are there any groups formed for hobbies, etc., within the staff?

   Not at present, but they could.

4. Is there a need for a bulletin board for staff use, e.g. for picnics, films, concerts, etc.?

   Yes.

VISITORS

1. What do visitors mean to SWRL?

   A means of disseminating information concerning the Laboratory by personal contact.

2. Are they welcome, and is an exchange of ideas encouraged, or do they only "take" information?

   Visitors are welcome, and exchange of ideas is encouraged.

3. Who are the visitors, e.g. teachers, people from other research facilities?

   Visitors are from the attached list entitled "The World SWRL Lives In:"

4. Is an atmosphere of the building being open to the public desired?

   Yes, insofar as the work program would not be hindered by outside visitors.

5. Do visitors come in groups or alone or both?

   Both.

6. Is visual access to the activities enough or is there need for constant discussion?

   There is a need for constant explanation.

7. Do visitors necessarily need a guide?

Yes.

8. What do they want to see?

The visitors would like a general overview of the Laboratory--SWRL's operation and its projects. Sometimes visitors have specific questions about SWRL.

9. Are there any areas which are not open to the public and why?

No, except in those instances where the traffic of outside visitors would interfere with the work load.

FLEXIBILITY

1. Which aspects of SWRL's activities are likely to change and how, e.g. size of research teams; methods of research which may require new and different spatial characteristics than those existing?

It is anticipated that for the foreseeable future, the computer facility, conference room, simulated classroom, production space, reception area, and controlled experimental areas will not require space in addition to that included in the figures prepared by the architects. The size of research teams and methods of research could change dramatically.

2. Is it important to make clear just what needs to be flexible, and why?

If it were possible, we would like everything to be flexible. However, this does not appear to be possible except in the area of office space.

3. In the existing arrangement have the changes which have been made form a pattern?

No.

4. Please consult Pattern 40 on office flexibility in the Multi-Service Center report, as this may bring to notice certain aspects of the flexibility problem?

Appears to be sound.

5. What sort of stress do the staff experience during the "moving" procedure?

Description of routine, reorganizing working space, become accustomed to new office partner and neighbors, moving from "cool-side" to "hot-side" of building, moving to office without window, moving to area of high traffic like the kitchen area.

RECEPTION

1. Which offices or facilities should be nearest the reception area?

The liaison staff of Educational Resource Service should be nearest the reception area.

2. Is the reception area just for receiving visitors, or would any discussions take place in the reception area if suitable facilities were provided?

The reception area may include a display area for the Laboratory products. Short discussions about the products would take place in the reception area if suitable facilities were provided.

3. How many full-time receptionists are there?

There are three full-time receptionists now. It is hoped that there would be need for only two in the new facility.

EXPANSION

1. Which facilities would be housed in the expansion program?

Staff offices and working space.

2. What is the relationship between the new facilities and the existing ones?

As quickly as possible, the total operation will be housed in the new facilities, and the existing ones will be shut down (depends on lease termination dates).

3. As the staff increases communication and interaction between staff members will lessen. In which areas would frequent contact be desired? This could influence the situation and type of meeting rooms, lunch rooms and outdoor areas, for example.

Provision should be made for informal contact of staff members within the lunch rooms and outside areas. It is questionable in our minds whether promoting informal contacts in meeting rooms and offices would accomplish anything.

ADMINISTRATION

Directors:

1. Do the directors have their offices together, or are they separated with different research groups?

   The directors now have their offices together.

2. Do they wish to have any overview of any activities or people, if so which ones?

   No. However, maximum access to as many parts of the facility as possible is desirable.

3. Do they require any special privacy?

   Yes, from any heavy flows of traffic--also true of Element Heads and Unit Heads.

4. Do they have any special needs, e.g. a second entrance?

   No.

5. Is there a need for meeting rooms for them? If so, who attends the meetings?

   There is a need for a meeting room to hold up to 15 persons adjacent to the Director's office. The Program Council, visitors to the Laboratory Director, and occasionally a committee of the Board of Directors.

Staff:

1. How many departments are there in the administration?

   Two, Planning and Review and Business Services.

2. How many people in each department?

Planning and Review with 6 persons and Business Services with 16 persons.

3. Are the departments sprinkled throughout the building or are they in one group?

The Business Services Department is sprinkled throughout the building. Planning and Review is in one group.

4. Do salesmen come to visit this department?

The Business Services Unit has many contacts with outside representatives such as salesmen, auditors, etc.

5. Who do the different departments interact with?

The Business Services Unit interacts with the entire Laboratory.

6. What sort of office accommodation do the different members of this department require, e.g. one man offices, typing pools?

Two-man offices for the purchasing, accounting, office service, and personnel functions (six to ten persons). Some desk space in a central supply area for three or four office assistants. A one-man office for a Business Officer and space for his secretary.

QUESTIONS ON OFFICES TO BE INVESTIGATED BY JIM SMITH

1. How often do projects change? What is the average number of people working on a project? How do these offices change physically (tearing down walls, adding more furniture, etc.) with the changing of projects?

We term "project" to define one of our four major areas of interest, Communication Skills, Problem Solving, Instructional Technology, and Staff Training. These projects have not changed since the beginning of the Laboratory and no changes are foreseen. The average number of people working on a project is 20 to 30. There has been no physical changes in the offices with the changes of activities within projects.

2. Who interacts with whom on the projects? Where do they interact? How often do they interact?

   There is daily interaction among staff members within an Element, usually within individual offices. Small group meetings are also held three or four times a month.

3. What is the typical day for each type of employee for each department (in minutes)?

   a. The secretaries
   b. The technicians
   c. The researchers
   d. The administrators

   Non-exempt employees work an eight-hour day. This would include secretaries and technicians. Researchers and administrators work a minimum of eight hours per day.

4. Who uses the library? How often? Is there a problem with losing documents and not knowing who has what? How many documents are in the library?

   Secretaries, researchers, and administrators use the library. The library is in use all day long. Sometimes there is a problem of losing documents and not knowing who has what. There are approximately 2,000 documents.

5. Is there distribution of reports, journals, working papers, newspapers, etc., between the staff?

   Yes.

6. What is the turnover rate of the researchers, their assistants and the secretaries?

   Please see the attached memorandum to Dr. Richard E. Schutz, dated April 7, 1969.

7. How do outside staff (consultants) interact with the research staff on a project? Where and how often do the types of interaction take place?

   Meetings with individuals or small gruops in offices three or four times a month. Contacts will increase in future as use of consultants increases. Please see Guidelines for Use of Consultants December 1967 - November 1968.

Attachment 12. List of Patterns

CONTENTS

1.00 Simulated Classroom Area

1.01 Outdoor Experimental Area
1.02 Children's Reception Space
1.03 Classroom Bathroom
1.04 Flexibility Within Simulated Classrooms
1.05 Classroom Storage
1.06 Classroom Sink Area
1.07 Adjacent Outdoor Experimental Areas
1.08 Connection Between Child and Adult Areas
1.09 Control Room for Experimental Areas

2.00 Circulation and Contact Between the Staff

2.01 Staff Walk
2.02 Vertical Circulation
2.03 Corridor Meeting Niches
2.04 Short Corridors
2.05 Open Staircases
2.06 Office Noise Isolation
2.07 Office Sub-Areas
2.08 Bulletin Board
2.09 Adjacencies for Manager of Resource Services
2.10 Personnel Office Near Main Entry
2.11 Director's Seminar Room
2.12 Square Seminar Rooms
2.13 Programmers Office Near Computer Room
2.14 Research Director's Location

3.00 Staff Office Area

3.01 Grouping Research Offices
3.02 Researcher's Office
3.03 Researcher's Workspace
3.04 Researcher's Secretary
3.05 Secretaries' Workspace

4.00 Main Conference Area

4.01 Conference Kitchen
4.02 Conference Milling Area
4.03 Main Conference Location
4.04 Main Conference Flexibility
4.05 Conference Room Shape
4.06 Conference Storage

5.00 Production Area

5.01 Receiving Location
5.02 Illustrator's Light Quality
5.03 View Into Production Areas
5.04 Draftsmen/Illustrators' Space
5.05 Mail Room
5.06 Artists' Wet Space
5.07 Production Chief's Office
5.08 Central Xerox Facility
5.09 Location of Heavy Duty Washroom
5.10 Office for Audio-Visual Supervisor
5.11 Isolation of Light, Sound, and Vibration for Audio-Visual Studio
5.12 Control Complex for Audio-Visual Studio
5.13 Audio-Visual Film/Tape Library
5.14 Alcove for Viewing Audio-Visual Studio
5.15 Ceiling Height in Audio-Visual Studio
5.16 Storage Next to Audio-Visual Studio
5.17 Observation into Audio-Visual Studio

6.00 Reception Area

6.01 Reception Waiting Area
6.02 Reception View
6.03 Reception Alcoves
6.04 Receptionist Situation
6.05 Two-Stage Reception

7.00 Siting & Entrances

7.01 Covered School Bus Waiting
7.02 Covered School Walkways
7.03 Visitor Parking
7.04 School Bus Parking
7.05 Visitor Parking and Entrance
7.06 First-Come, First-Serve Parking
7.07 View Overlooking Life
7.08 View Overlooking Nature
7.09 Mobile Canteen Parking
7.10 Building Identification Sign

8.00 Library

8.01 Library Location
8.02 Library Mini-Services
8.03 Microfilm Storage
8.04 Library Acquisition Area
8.05 Location of Library Index
8.06 Library Entrance
8.07 Book Depository
8.08 Individual Study Carrels
8.09 New Acquisitions Display
8.10 Library Armchairs
8.11 Library Stack Circulation
8.12 Librarian's Processing Desk
8.13 Librarian's Office
8.14 Library Cataloging Room
8.15 Microfilm Area

9.00 Miscellaneous

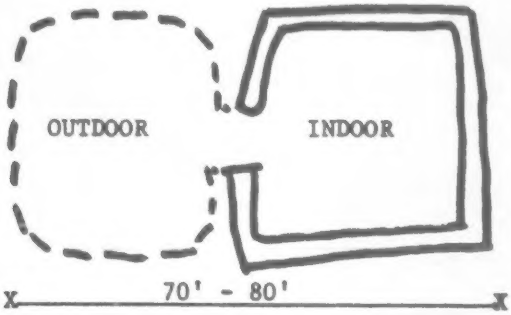
9.01 Portable Wall
9.02 Ceiling Heights

Attachment 13. Sample Patterns

OUTDOOR EXPERIMENTAL AREA

IF: There is an area in a research facility involving instructional experimentation with children,

THEN: Adjacent to each indoor "classroom", there is an outdoor "classroom", maximum dimension of which is 50'0". The maximum distance from any point inside the indoor classroom from any point in the outdoor classroom is 70-80 feet. The outdoor area has different areas corresponding to the breakdown of areas in the indoor classroom, i.e. individual areas, group alcoves, and large group space. The area is 50% shaded by trees and 50% unshaded.



PROBLEM

In recent educational research, it can be seen that the strict division of "work" and "play" as separate activities which take place "inside" and "outside" respectively, is breaking down, and the place is being thought of as part of a continuum of indoor, semi-enclosed, and outside spaces.

From Murray Silverstein, "The Child's Urban Environment," National Congress of Parents and Teachers, p. 44:

"Our schools present a biased sense of epistemology. It usually goes like this: 'Inside the building we learn; out in the yard we play. Knowledge or sense passes from books or teachers inside the building, but play is something different than knowledge, it is fun, but essentially nonsense.' This view, as we have seen earlier, has nothing to do with the child's own tendencies to learn. He just does not make distinctions of this sort.

"Another example: Many schools have a fence around them. Inside the fence is school-books-knowledge; outside the fence is something quite different - the city, the world. What has one to do with the other? Again, such distinctions run counter to the child's deepest tendencies. He is looking for concrete intuitive excitement, and he wants what he learns to be relevant to the wondrous world before him. Yet if the school offers empty, bewildering drills, tasks whose bearing on his present or future needs is clear to everyone but him. School becomes an island, with its own goals and achievements, its special anxieties. For the child it is a peculiar and stressful double bind."

The outdoor and indoor area should be adjacent to each other, with visual access between so that if one teacher has to supervise activities in both these areas he can do so from one spot. From "Space for Teaching," by W. W. Caudill, Bulletin of the Agricultural and Mechanical College of Texas, p. 46:

". . . It is important for a separate outdoor classroom to be related to the indoor classroom. This area used for nature study and recreation can also be used to a great advantage for other courses. For example, a reading lesson telling of the beauty of spring can be more effectively understood by the child when the class is in the shade of a tree rather than in a dark corner of the classroom. Studying arithmetic by plotting a garden, building cities of blocks in the open, stretching in the out-of-doors, all tend to increase the interest of the child. If this outdoor classroom area is properly designed in relation to the classroom, the teacher may conduct a small group in spelling drill inside the classroom and still have good supervision of another group which is studying pets in the outdoor pens, and another group which is developing a building project in the grass yard."

Each indoor classroom should have an outdoor classroom, in order to fully realize the integration of "work" and "play" (as mentioned earlier). If the outdoor classrooms were shared, by either two or more indoor classrooms, the activities by another group may be disturbing to those in the indoor classrooms adjacent. Also again to fully realize the integration of "work" and "play", to share the outdoor facilities with other class groups and not the indoor classrooms would tend to make an artifical segregation of the two activities.

The maximum area of the classroom is determined by the fact that the teacher should be able to see the children from any point in the indoor classroom, for supervision. In the case of any difficulty developing between the children, for example, the teacher should be able to recognize who the children involved are, to be able to call them individually to attention and help them.

From "Seeing Distance," Hans Blumfield, Scale in Civic Design, Town Planning Review, April, 1953, pp. 35-46:

"A person's face can be recognized at up to 70 or 80 feet."

Thus, the maximum distance from any point in the indoor classroom to any point in the outdoor classroom is 70 - 80 feet. The minimum area of the outdoor classroom, is determined by the following points; the activities in the outside space, by virtue of their very nature will require more area per child than the indoor space.

Several factors indicate that the area of the outside classroom must be greater than that of the indoor area. The outdoor area, provides a transition between the inside and the total outside world, and the activities which may go on in the outdoor area, e.g., games, running, etc., will require more area than activities which may go on inside.

It is our feeling that the outdoor classroom should be at least twice that of the indoor classroom, although no firm evidence regarding this has been found.

Caudill in "Space for Teaching" mentions that the "The outdoor classroom should be at least twice the size of the regular classroom," however, he gives no reason why.

From the above discussions we can determine the maximum dimension of the outdoor classroom:

x = maximum indoor classroom dimension

$2x$ = maximum outdoor classroom dimension

$x + 2x = 75$

therefore, $x = 25$.

$2x = 50$.

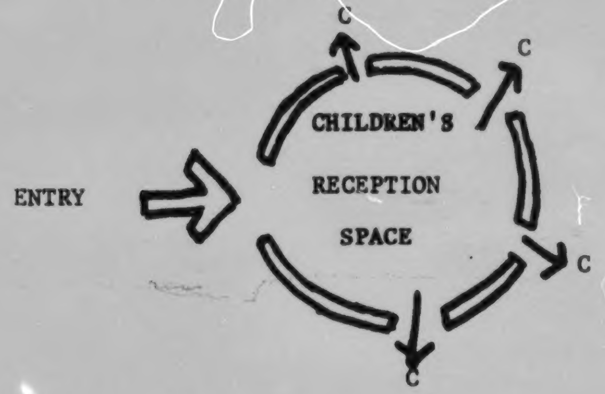
Children may wish to carry out activities in the outdoor classroom, individually, or in groups. Areas should be defined by planting and landscaping to form areas for these activities; in this way children will be able to appreciate the fact of being outside and the effects of nature.

Where the building is situated in a hot climate, it is necessary that there be shaded areas (see Arthur Leland and Lorna Leland, Playground Technique and Playcraft, New York, 1913, p. 118), as in sunny weather children seek the shade. If the sun is very hot children seek the shade for a substantial part of their activities. Since it seems reasonable to put 50% of the area in shade and leave 50% unshaded. The outdoor classroom should be shaded by trees rather than by any structure. Not only is this much more pleasant, but when one is outside one should be able to experience nature and its own way of sheltering and protecting.

CHILDREN'S RECEPTION SPACE

IF: There are classrooms for children in a research and development facility,

THEN: There is a children's reception space allowing 7 square feet per child. The classrooms are adjacent to this area and the interior of the classrooms are visible from the reception area by windows 5 - 10 feet long, by 2 feet high, centered 4 feet from the floor. The space is adjacent to the child's entry court and the common wall is fully glazed. Low, bench type seating is placed in the space but located away from the walls.



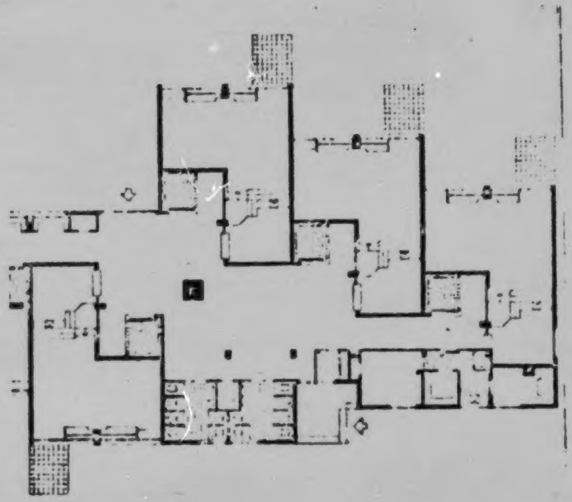
PROBLEM

The children involved in the experiments at a research facility will be coming from different schools, be of different ages, staying different lengths of time and be involved with different experiments. As such, they do not have much in common. However, there are certain activities which will be indulged in by all groups. For example, all students will be arriving at the facility by vehicle, and have the same entrance problems to solve.

The reception area should provide the link between the offices and the "school." The staff may enter this area and be able to see which children are in which classrooms through the small windows, without disturbing the class.

Benches in the space provide the opportunity for children to form small groups and to get to know one another. Placing them toward the center of the space, away from the wall encourages this, for children like adults, feel uncomfortable in the entry of a large open room with no reference points close at hand.

From Architectural Record, July 1968, p. 121, a small primary school in Delft shows:



Although the children will then go to their respective classrooms they will naturally be curious to know and see what goes on in the other classrooms of their temporary school. The children should have the opportunity of being able to see and speak to each other during a typical visit to the facility in a natural way.

Thus, before they enter the classroom, they should enter an area which is common to all the children. From this area it should be possible to see into each classroom, although this visual access should not be disturbing to those who may be inside the classroom. A reception area, serves this function. This area can also be used by the children for breaks and recess during wet or cold weather when it is not advisable for them to go outside.

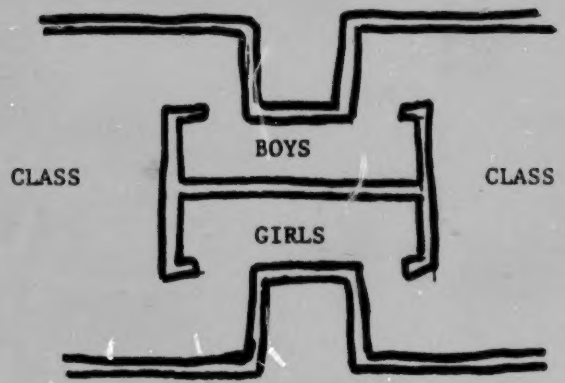
A small window between 5-10' long and about 2 feet high, located so as to accommodate the different heights of children should be placed on the wall of the classrooms facing the reception space. The reception space should allow for 7 square feet per child and be able to hold at one time the maximum number of children expected at the facility during any one time.

The children should be able to see where they have come from in order that they be able to orient themselves more easily and that they be able to see some continuity in their movements. From the reception area it should be possible to see the children's entrance court. Thus, the reception area should be adjacent to the children's entry court and the wall between them should be glazed.

CLASSROOM BATHROOM

IF: There is a research and development facility where there are rooms for simulated classroom research,

THEN: For every two adjacent classrooms there is a separate bathroom for each sex. The doors to the bathrooms lead directly from the classroom, but are not visible from any part of the classroom proper. One set of facilities for boys and girls is accessible from the children's reception area.



PROBLEM

Children should be able to use bathroom facilities without leaving the classroom. Much time is wasted if the bathrooms are located outside the classroom. The reason for locating bathrooms outside the classrooms may be to centralize the facility, but from "Plumbing Fixtures for Educational Facilities," by J. D. MacConnell and W. R. Odell, School Planning Laboratory, School of Education, Stanford University, p. 25 we see:

> "Gang toilets at best present difficult problems of maintenance and operations as well as supervision. . ."

Therefore, bathrooms should then serve only one or two classrooms, and thus will be of a more domestic scale. Since in a research facility context, the number of classrooms being used at one time varies, it may be wasteful to provide bathroom facilities for each classroom. Thus each two adjacent classrooms share one bathroom for each sex.

The exact requirements of each room will be according to the number of students and fixed by local codes. However, since the age group of the children using the classroom does vary, there should be a minimum of one toilet for younger children and one toilet for older children. It is important that there be a toilet for the smaller children, since they would have this kind of facility in their normal school.

The children may wish to use this facility immediately after all the excitement in their new environment, and they should be able to do this without traveling through the classroom. Therefore, at least one bathroom for each sex should open off the reception area.

"Toilet rooms should be no larger than necessary to accommodate the required fixtures and the anticipated traffic, in order to cut down loitering. A toilet stall with doors, requires a space approximately 2½' wide, 4½' long, with 5 feet of passage way running along the row of stalls. Lavatories and wall hung urinals each require approximately 3 square feet of floor space. Lavatories or wash fountains should be situated nearer the door than the toilets.

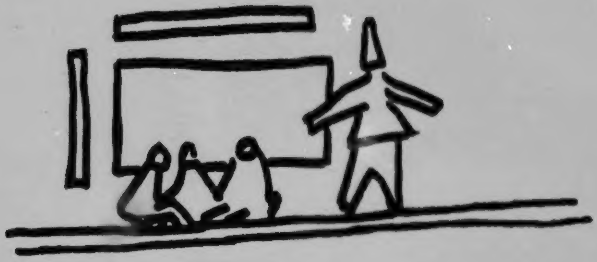
"Mirrors should be located near but not directly over lavatories in order to get fuller use of lavatories and to cut down on hair clogging of drains; on the junior high school and senior high school levels, a book shelf should be provided near the entry." (op. cit., page 25.)

The door to the bathrooms should not be visible from the classroom proper, since the child may feel that everyone is watching him enter and leave the bathroom. There is also the problem of children peeping into the bathrooms.

FLEXIBILITY WITHIN SIMULATED CLASSROOMS

IF: There is a research and development facility where there are rooms for simulated classroom research,

THEN: There are moveable-adjustable partitions in the horizontal as well as the vertical plane. These can be arranged to form a variety of smaller learning spaces. They are demountable and moveable by one person. There is no equipment in the testing area which is fixed to the floor.



PROBLEM:

The variety of experiments that will occur in these experimental areas will require spaces of different sizes and different spatial quality. Some may require small intimate areas, others a large play space. To provide fixed rooms of different sizes for all the anticipated experimental needs would be impractical as the cost would be prohibitive and it would be too difficult to predict future needs with accuracy. Furthermore, the occasion might arise where many rooms of the exact same size are required.

This pattern proposes that there be a method of creating these spaces within the bounds of the larger shell of the classroom. For example, a lightweight panel system with small rollers or wheels could easily be adapted by a researcher to fit his experimental requirements.

Other furniture in the room should not be fixed to the floor so that it can be moved with the panel system to define the smaller spaces within the larger classroom.

Attachment 14. Staff Reactions to Patterns

SWRL

DATE: July 16, 1970

TO: Division Heads

FROM: Richard E. Schutz

SUBJECT: FACILITY PATTERN STATEMENTS

COPIES TO: Directorate

You will recall the planning we did in 1969 with consultation assistance from the Center for Environmental Structure to prepare pattern statements which specify our functional program requirements in a manner that they can be incorporated into the facility design. A copy of the pattern statements and a definition of environmental patterns are enclosed.

To insure that all of our staff have an opportunity to contribute to the planning of the new facility, I should appreciate your taking the necessary action to see that appropriate members of your Division review at least the patterns which pertain to your sector of the program and submit any additional patterns you feel desirable to Mr. Hein. Any statement that is architecturally and cost feasible and is not inconsistent with already adopted patterns will be incorporated into the facility. The earlier a proposed pattern statement is submitted, the greater the possibility that it can be incorporated into the facility design. Proposed statements need not elaborate the "Problem" section to the extent that CES has done in some cases and the graphic representation need not be included.

A limited number of additional copies of the pattern statements are available from Mr. Hein. As further pattern statements are approved, copies will be forwarded to you.

While it is unreasonable for any of us to "play architect," the pattern format does provide an efficient mechanism for specifying functional facility requirements. Without spending an undue amount of staff time and energy on the matter, some modest attention to planning now will help insure that the new facility meets every requirement we can specify.

RES:kb
Encs.

ENVIRONMENTAL PATTERNS

FOR SWRL RESEARCH AND DEVELOPMENT FACILITY

The Laboratory is systematically patterning the design of its new facility to meet functional program requirements. This work is being conducted with the consultation of the Center for Environmental Structure, Berkeley. CES has formalized analytic techniques termed environmental pattern language which provides a means of representing program requirements in a manner amenable to design solutions.

Each pattern includes an "if/then" statement and an accompanying discussion. The "if" is expressed in program terms; the "then" is expressed in terms of design consequences; the discussion delineates the program-design-solution rationale. In full, the statement of each pattern reads like this:

IF: X THEN: Z / PROBLEM: Y where

X defines a set of conditions,
Y defines some problem likely to occur under the conditions X, and
Z defines design relations which must be present under the conditions X to solve the problem Y.

In short, IF the program conditions X occur, THEN we should do Z, to solve the PROBLEM Y.

The analysis has the following advantages:

- Any aspect of the environment which can be defined in terms of functional conditions can be represented as a pattern.
- The functional basis for each pattern is clearly stated.
- Each pattern has a format which encourages criticism and feedback.
- Patterns may be combined as elements of larger and more complex program-design-solutions.

The SWRL patterns are organized into the following pattern clusters:

1. Simulated Classroom Area
2. Circulation and Contact Between the Staff
3. Staff Office Area
4. Main Conference Area
5. Production Area
6. Reception Area
7. Siting & Entrances
8. Library
9. Miscellaneous

The pattern statements are being cumulated and updated as the architectural design of the facility proceeds. A current file is maintained by the Laboratory Director of Business and Operations.

Attachment 15. Additional Patterns from Staff

SWRI

DATE: July 2[illegible], 1970

TO: Dr. Richard Schutz

FROM: Robert W. O'Hare f. O'Hare

SUBJECT: Facility Pattern Statements

COPIES TO:

Attached are statements by DRS personnel regarding Patterns for an Educational Research and Development Facility. In addition to the attached, please note the following:

1. Re: flexibility

   The "patterns" mention flexibility many times. I am in favor of flexibility. The potential danger I see, however, is in including so much flexibility that many basic functions are hindered--too many compromises. (Example from school construction: Flexibility in designing an auditorium to serve also as a cafeteria or part of cafeteria. Many times the result is that the space is not fully adequate for the basic functions of either an auditorium or cafeteria.)

2. Re: 1.06 [illegible]

   Ages 6-17 mentioned for subject age.
   Reaction: This should probably be expanded in both directions.

3. Re: 2.09

   Office of resource service "director" should be within 200 feet of offices of production chiefs.
   Reaction: okay but not necessary to be within 200 feet.

4. Re: 2.10

   Payroll office should be close to reception-entry.
   Reaction: nothing wrong with having payroll close to reception-entry, but many other functions need to be accommodated in this area also and I would make payroll a low priority.

RO'H:ch
Attachment

ADDITIONS TO EXISTING PATTERNS

4.04 (a)

IF: Any main conference room

THEN: Sound absorbing materials should be used to control ambient noise and reverberations.

PROBLEM: Reverberations must be held to a level giving control of crowd noise, but not so low as to give the effect of a tomb. Since the conference room will be used for lectures, conferences, and audio-visual presentations and recording, the ambient noise level should be low.

ADDITIONS TO EXISTING PATTERNS

4.04 (b)

IF: Any main conference room

THEN: Lighting must be under complete control and must be arranged for maximum comfort to persons seated facing a dais.

PROBLEM: With eight foot ceilings and usual lighting fixtures, it is commonly found that a ceiling light will be shining into a viewer's eyes without illuminating the desired scene. Peripheral vision is active enough in most people to make such unwanted light a problem in even a fairly small room. In long low rooms such as classrooms and conference rooms the effect can be very tiring to the eye. One solution is to recess the light sources so that the light radiates directly down and is not visible at the other extreme of the room. Suitably designed baffles can be effective when located correctly.

In conference and classrooms the ceiling lights can be arranged in banks to allow conflicting lights to be turned off.

If the ultimate in reading ease is required, the flourescent lamps used should be of the cool green variety. The absence of powerful red spikes in the spectral distribution reduces the problem the eye has in focusing widely disparate colors. The cool green lamps have a distribution that closely matches that of sunlight.

Lighting grids can be included as a fixed installation for program recording without subtracting from the use of the room for the other functions. The extra ceiling height required for the grids will give the room a more comfortable feeling.

ADDITONS TO EXISTING PATTERNS

4.04 (e)

IF: Any main conference room

THEN: There should be special accommodations for remote control projection screens and TV monitors, microphone and video receptacles, and a central control room.

PROBLEM: Remote control projection screens and TV monitors will be useful for most functions. The monitors can be used for telectern purposes allowing a lecturer to illustrate his lecture as he proceeds. Audio speakers should be arranged for use as sound reinforcement as well as audio-visual presentations.

Microphone and video receptacles should be located around the room so that microphones and cameras can be quickly set-up for recording conferences, seminars or formal productions.

Projection and control equipment can be located within a control room at one end of the large room. Two assembly rooms can be located around one control room. All heat and noise will be dissipated within the control room.

ADDITIONS TO EXISTING PATTERNS

5.8

IF: There is a A-V supervisor's office adjacent to the Production Studio and Control Complex,

THEN: There should be a door into the A-V supervisor's office which does not require going through the Production Studio or Control Complex.

PROBLEM: Interruptions during recordings will occur unless the A-V supervisor and his visitors have independent access to his office.

ADDITIONS TO EXISTING PATTERNS

5.12 (a)

IF: There is a separate Control Complex adjacent to the A-V Production Studio,

THEN: There should be a window and intercom between the Audio and Video Control and an intercom between the Production Studio and both the Audio and Video Control.

PROBLEM: Visual and vocal communication is necessary between each of the above rooms in order to conduct recordings efficiently.

Attachment 16. Architect's Reactions to Patterns

Skidmore, Owings & Merrill ARCHITECTS/ENGINEERS

ONE MARITIME PLAZA
SAN FRANCISCO CALIFORNIA [illegible]

JOHN M WOODBRIDGE A I A
ASSOCIATE PARTNER

July 31, 1969

Mr. William H. Hein, Jr.
Assistant Director - Business
Southwest Regional Laboratory
11300 La Cienega Boulevard
Inglewood, California 90304

Dear Bill:

You have asked us to describe and evaluate the work of the Center for Environmental Structure in programming the new building for SWRL and to state the degree to which the proposed building will be able to fulfill the pattern criteria.

The Center's work goes well beyond the typical programming activity for a building in analyzing the spatial requirements for each identifiable activity in isolation, and in research and analysis to back up the resulting pattern or diagram for each function. In a building housing as unusual activities as the Southwest Laboratory, this kind of intense analysis of each activity is particularly valuable in defining the space requirements and in developing a plan which is an accurate reflection of the forseeable needs of the Laboratory. As a result of CES's work we have been able not only to assure ourselves of the adequacy of the projected 80,000 square foot building to accommodate substantial growth in staff, but also to test a variety of office space configurations which could occur within the projected envelope. Obviously the range decreases as the density increases, but with the initial staff projection of 250 there is a tremendous variety of office space arrangements which will fit into the space, all of which conform to the CES pattern of secretarial office and work space.

Since the majority of the building is office space and this is the area where flexibility is most important, I have remarked chiefly on the office areas. The patterns proposed for other areas are generally easily incorporated into the plans and pose no major problems beyond the simple policy question of whether or not the Laboratory accepts them as valid or, in a few cases, considers them worth whatever extra cost they may bear. Some few of the proposed patterns may pose architectural problems which can only be evaluated once the building is further designed, such as inside vs. outside exposure for a space, but we have progressed far enough in planning to assure ourselves that there are no major problems either in accommodating the number of staff projected or in reflecting the major pattern criteria in the plan.

Sincerely,

John M. Woodbridge

JMW:pi

Attachment 17. Consultant's Reactions to Schematics

XXXXXXXXXXXXXXXX
2531 Etna Street

XXXXXXX
94704

August 25, 1969

Mr. Paul Bartlett
Skidmore, Owings & Merrill
One Maritime Plaza
San Francisco, California

Dear Mr. Bartlett,

We have been asked by the architects to make a thorough review of the August 11th plans for the Southwest Regional Lab Facility with respect to the success with which our patterns have been incorporated. We understand that the plans have been developed with only the forty-six patterns of our first publication in the architect's hands. In summary we find that twenty-six patterns have been included, five have not been included, two have not been necessary due to the problems in context not arising, and thirteen have not been shown due either to the lack of detail in the drawings at this time, or to the fact that site development has not been studied.

The following is a review of implementation, pattern by pattern:

Child's World

Outdoor Children's Testing Area:

> The pattern is not evident in the plan. Lack of definition in the Children's Testing Area makes outside space definition impossible. Location of the outdoor areas on the external wall hold promise that this pattern can easily be accommodated.

Children's Reception Space:

The pattern is present. Visible access outside to the child's entry court should prove no problem, but visual link into the classrooms from the reception has not been provided in this plan.

Classroom Bathroom:

This pattern is not included. We recognize that the children's testing areas have not yet been finalized and that this pattern may be accommodated at a later date.

Child's World - Adult World Separation

Connection Between Child's World and Researchers:

Although the double door transition space is not literally present, the corridor adjacent to the court served the same function of isolation. We assume that the doors shown next to the wall, connecting child's world with reception and lounge, are fire doors only and will be fitted with appropriate hardware.

Circulation and Contact Between the Staff

Scholar's Walk:

Not indicated.

Vertical Circulation:

The pattern is present in the scheme due to careful placement of stairs and the central location of library and print room.

Corridor Meeting Niches:

The plan does not have enough detail at this stage to show mini-service location. Adjacent to each stairway would be a good place to locate a niche. The corridor between printing and shipping-receiving would be improved by a corridor niche.

Short Corridors:

All corridors save the one between print room and shipping-receiving, conform to the pattern. However, the glazed wall in the print room improves this and with the inclusion of a corridor niche the spirit of the pattern would be met.

Director's Location

Research Director's Location:

Detail shown does not allow judgement, but there seems to be no problem here in careful allocation of the director's office.

Administrative Director's Location:

The pattern is present.

Environment for Researchers

Grouping Research Offices:

This is one of the most important patterns and it has been well accommodated in these plans. Only the occasional offices which occurs inside next to the secretaries, do not conform. We propose that these not be constructed until a time when the operation expands and crowding becomes acute.

The bank of offices on the second floor, to the east of the mechanical space does not have workspaces adjacent to an external wall. We suggest that, if possible, the part of the mechanical room which is next to these workspaces be left open to the sky so that there will be natural light in the workspaces.

Researcher's Office:

The pattern is present.

Researcher's Workspace:

The pattern is present.

Researcher's Secretary:

The pattern is present.

Main Conference

Conference Kitchen:

The pattern is present with the exception of the openable wall adjacent to the conference room.

Conference Milling Space:

The corridor space to the west of the conference room serves this purpose, but is somewhat narrow and does not provide an easy link to the display area. We suggest that the corridor be widened both in front of the computer space and the conference room. The space could then serve for display and milling, creating an easy transition between reception, conference, and lounge.

To facilitate the connection between conference room and milling space we suggest that the adjoining wall be openable. A series of double doors would be ideal.

Main Conference Location:

The pattern is met. The ease of connection to the entrance would be enhanced with the widening of the corridor as suggested above.

Main Conference Flexibility:

The pattern has been met as close as local codes will allow. We understand that fire codes and egress requirements make it impossible to make the conference area on the right any smaller. Care must be taken on the design of the flexible wall junction to insure acoustic privacy.

Production

Receiving Location:

The pattern is present.

Location of Mobile Lab Garage:

The pattern is present save for the window for visitor viewing.

Reception

Reception Waiting:

Distance from the receptionist to the waiting area is too great. We suggest that the receptionist be relocated to the other side of the entry door.

Reception View:

The pattern is present.

Reception Alcoves:

The pattern is not present. We suggest that the first two offices to the east of the entry be designed to face the reception area and serve as reception alcoves.

Receptionist's Situation:

The pattern is present.

Siting and Entrances

Covered School Bus Waiting:

Not shown.

Covered School Walkways:

Not shown.

Visitor Parking:

Not shown.

School Bus Parking:

Not shown.

Dish-shaped Parking:

Not shown.

Adjacent Outside Space for Children and Adults:

In the design, the problem does not arise.

Service Entrance:

The pattern is present.

Identity of Child's World:

The pattern has not been included.

Number of Entrances:

The pattern is present.

Child's Entry Court:

Not shown.

Visitor Parking and Entrance:

Not shown.

First-Come, First-Serve Parking:

Not shown.

Staff Lounge

Lounge Level:

We understand that accommodation for handicapped persons make this pattern difficult to include. However, the placing of the stair within the lounge recognizes the interded spirit of the pattern.

Natural Light in Lounge:

The pattern is present.

Outdoor Lounge Area:

The pattern is not shown, but the doors from the lounge to the outside indicate the intent that it will be included.

Split Level Lounge:

The pattern is present.

Lounge-Service Connection:

The pattern has not been met.

View Overlooking Life

View Overlooking Life:

In all areas of the building the pattern has been met.

View Overlooking Nature:

The pattern has been met.

Miscellaneous

Secretaries Workspace:

Problems which would give rise to this pattern (large secretary pools) do not seem to be present in this plan.

Portable Wall:

The pattern does not show in plans at this scale.

Library Location:

The pattern is present.

Sincerely,

Ronald B. Walkey

RBW:mlr

Skidmore, Owings & Merrill

September 8, 1969

APPENDIX TO LETTER FROM THE CENTER FOR ENVIRONMENTAL STRUCTURES TO SKIDMORE, OWINGS & MERRILL, DATED AUGUST 25, 1969

The comments in the above letter regarding the inclusion of patterns developed by CES in the schematic plans prepared by SOM are based on drawings dated August 11, 1969. Certain patterns are referred to as "not included" or "not indicated" particularly those related to site development and to simulated class rooms. In addition a number of detailed patterns have been submitted subsequent to the preparation of the above drawings.

The schematic plans represent the general organization and nature of the building but it should be recognized that as the project progresses various aspects will be subject to considerable further development. As this occurs patterns made available subsequent to the development of these schematic drawings, as well as patterns available but not included because they involve aspects of the project which have not yet been subject to detailed planning, will be integrated into the design.

Paul Bartlett
Skidmore, Owings & Merrill

PB:cg

Attachment 18. Responses to Project Officer re Review of Application

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT
11300 LA CIENEGA BOULEVARD · INGLEWOOD, CALIFORNIA 90304 · TELEPHONE 776-3800 AREA CODE 213

May 11, 1970

Mr. Howard F. Perry, Jr.
Program Coordinator, Educational
Research Facilities Program
Division of Educational Laboratories
U. S. Office of Education
Washington D. C., 20202

Dear Howard:

In our telephone conversation of May 4, you specified several general areas in which questions might arise at various stages of the review process. We have set forth below our responses. We would be most happy to supplement these answers if you feel it is necessary.

1. To what extent are the conclusions of the Center for Environmental Structure valid?

The Laboratory systematically patterned the design of the facility to meet functional program requirements with the assistance of CES. The Laboratory agrees with the Architect's evaluation of the work of the Center as set forth in a letter dated July 31, 1969, (Exhibit 14).

2. To what extent were the functional specifications discussed with the staff of the Laboratory?

Staff members from the Center for Environmental Structure held extensive discussions concerning the functions to be performed in the special purposes spaces with staff members responsible for the respective functions.

3. The Laboratory should be prepared to explain to the panel members its five-year program plan.

The Laboratory's five year plan was thoroughly reviewed by a team of outside consultants earlier in the review process. Therefore, the facility panel will be concerned with the substantive aspects of the Laboratory's work program only insofar as they might affect the physical design of the building. Exhibit 10 contains the "scenarios" that were presented to the program review team as the five-year plan. The Laboratory staff will make a short explanation of the scenarios under section 10 of the proposed agenda - "Program Objectives." If you think it would aid the panel, you might make available to them a summary of the reports of the consultants on the program review panel.

4. The internal reconfiguration that will occur between the move-in date and the end of five years should be explained.

We have given up the idea of phasing from a move-in internal configuration to a five-year configuration. Instead we are planning a single internal configuration based on our five-year staff projections with a verbal explanation, if necessary, as to how the space will be utilized for the first five years.

5. A more detailed explanation of costs estimates should be presented by the architects.

The cost figures contained in the application were prepared by the architect's estimating department. In preparing these estimates, the architects "took the job off" the plans just as a contractor would in preparing a bid. The estimates are now present in the application in the form required by the "draft guidelines." However, the architects will have supplementary materials for the review panel to respond to any further questions.

6. The need for eight acres should be justified.

The schematic site plan indicates why a full eight acres will be utilized. In Southern California, there is no public transportation; therefore, everyone must drive to work. The architects have stated that 1 acre will provide parking space for 100 cars. Thus, 4 acres alone are needed for parking. This leaves 1 acre for the building itself and 3 acres for approaches, driveways and required "set backs" from the adjoining streets.

7. What additional cost would be incurred as a result of the inclusion of the courtyard?

The additional cost, if any, will be included in the architect's back up materials concerning cost estimates that will be available at the review meeting.

8. An updated construction cost escalation factor should be included that is keyed to a reasonable construction schedule.

This will be included in the updated facilities budget in the supplement to the application.

9. Equipment lists should be updated.

There are no changes in the equipment lists as submitted. Because $4.6 million is considerably below the $7 + million originally requested, it will not be possible to buy all of the equipment needed. However, we are prepared to justify every item at the review in the event that additional construction funds become available in the review of the applications of the other two laboratories.

10. The relationship of the equipment lists to the ed specs should be clarified, and the module used to cost office equipment should be set forth.

The ed specs contained in Exhibit 19 set forth the equipment that will be "housed" in the described spaces in the facility. The movable equipment lists in Exhibit 22 list those items that the Laboratory will not have acquired from operational funds by the anticipated move-in date. As explained in paragraph 9 above, the Laboratory is seeking approval of all equipment listed in Exhibit 22 in the hopes that adequate funding will be made available. The module requested is included as an attachment to this letter.

11. It should be explained why provision was made in Exhibit 22 for office furniture and equipment for only 110 staff members and 20 secretaries.

It is the Laboratory's best estimate that this is the additional office furniture and equipment that will be needed during the next five years above that which should be on hand on move-in day.

12. Totals for the production equipment are presented in Exhibit 22. A more detailed break out should be prepared.

The production equipment is set forth in Exhibit 22 as "packages" of components that will accomplish the program objectives of the Laboratory. We consider all components to be essential to the system for which it was designed. Nevertheless, at the review, we shall be prepared to discuss the costs of individual components.

13. Exhibit 22 contains a list of print shop equipment, several items of which are labeled "replacement." Why is replacement equipment included in the application?

    The Laboratory does not intend to increase its reproduction capacity above its present level. Reproduction equipment does, of course, wear out, and it is our best estimate that the useful life of the items listed will end near the move-in date. Therefore, good planning requires that the replacement equipment be delivered to the new facility and installed so as to minimize lost time in reproduction work.

14. The area specified for the mechanical area seems large.

    The size of the mechanical area was specified by the mechanical engineering unit of the architectural firm. The architects have stated that it is impossible to know if it will be smaller until the exact equipment that will be located therein is specified later in the design process.

15. There appear to be a great deal of undesignated space in the schematics second floor plan.

    The architects intended the partial internal configuration for office spaces shown on the third schematic in Exhibit 24 to be considered as applicable to those undesignated areas. The lines indicating this do not show up clearly on the copy appearing in the application.

16. What is a "simulated classroom?"

    The need for such space is described on pages 9 et seq. of the application. As stated therein the 2,850 square feet will be configured into currently standard classrooms. Moreover, the requirements set forth in Space Requirements Form #21 in the ed specs (Exhibit 19) are quite modest and have little, if any, effect on the building's structure.

Sincerely,

William H. Hein, Jr.
Director of Business

WHHJr:dr
Attachment
cc: Mr. Doug Merrill
Dr. Richard Schutz
Dr. Robert Baker
Dr. Harry Handler
Mr. James Taylor

Attachment 19. Agenda for Review of Application

Agenda for Review of SWRL Application for Construction Funds

I. Criteria and Justification - 2 hours

A.	Criteria to be applied by review panel	Project Officer - Perry
B.	Justification of grant application	Laboratory Staff - Schutz
C.	Program objectives	Laboratory Staff - Handler and Baker
D.	Program budgets	Laboratory Staff - Hein
E.	Personnel requirements - current and projected	Laboratory Staff - Taylor

II. Functional Specifications - 4 hours

A.	Introduction and planning history	Laboratory Staff - Schutz
B.	Implications for building design	Laboratory Staff and Architects - Hein and Merrill
C.	Program requirements	Laboratory Staff - Handler and Baker
D.	Tabulated requirements	Laboratory Staff - Hein
E.	Summary of space needs; space analysis	Laboratory Staff - Hein
F.	Movable equipment	Laboratory Staff - Baker
G.	Facilities budget	Architects - Merrill
H.	Estimated construction schedule	Architects - Merrill
I.	Schematic design and outline specifications	Architects - Merrill

III.	Mechanics of acquiring use of property - ½ hour	Laboratory Attorney - Halverson
IV.	Small group meetings - Lab and panel - 2 hours	Chairman of Panel
V.	Joint group meeting - ½ hour	Chairman of Panel and Schutz
VI.	Executive session	Chairman of Panel

Attachment 20. Notice of Grant Award

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

June 30, 1970

Dr. Richard E. Schutz
Laboratory Director
Southwest Regional Laboratory
11300 LaCienega Boulevard
Inglewood, California 90304

Dear Dr. Schutz:

This letter is to inform you that the Office of Education has completed its review of the Southwest Regional Laboratory's September 1969 proposal for an educational research facility, and that the basic program decision on the proposal has been made.

Based upon the recommendations of the staff and consultant reviewers, and subject to the conditions specified below, the Office hereby approves the proposal at a level of funding not to exceed $4,286,000. This approval is extended under the authority vested in the Commissioner of Education by the provisions of Section 4 of the Cooperative Research Act, as amended, and is subject to the availability of funds to the Office of Education for the Educational Research Facilities Program. Further, this approval is contingent upon the award and acceptance of a grant which defines the scope of effort, terms and conditions of the award, other requirements established in the Act and the Federal regulations adopted thereto, and the level of funding, as indicated.

The functional specifications for the proposed SWRL facility are accepted for budgetary and planning purposes, with the following stipulations:

1. The facility shall have a gross area of 86,400 square feet and a net assignable area of 59,390 square feet, and shall be designed to house a projected staff of 430.
2. The proposed space allocations for mechanical and computer equipment shall be reexamined and reduced, and the interrelationships between areas within each of the major divisions (e.g. Product Design, Product Integration) carefully reevaluated.
3. The specifications for environmental control and utilities shall be reexamined and more precisely formulated as facility planning progresses. Particular attention should be paid to the media and computer spaces, as well as to the demonstration classrooms.

Exhibit J

4. The equipment list shall be restudied and reformulated as necessary to comply with the budgetary ceiling for equipment procurement. A more detailed strategy for procuring equipment necessary for the functioning of the facility, but not supported by the grant, must be formulated.

future

5. The design and cost implications of the proposed office landscaping must be carefully examined at the earliest stage of facility planning. The implications of this concept for the utilization of existing equipment and the procurement of new equipment must be very carefully analyzed.

architects

As a consequence of the recent introduction of excess Federal real property into the Office's consideration of the Laboratory's proposal, two alternatives for meeting the approved functional specifications are to be explored by the Laboratory. The first, "Option A", is the build-to-suit lease arrangement with the Segerstrom Industrial District, as outlined in the proposal. The second, "Option B", is the construction of a SWRL-owned facility on excess Federal land to be made available at the Los Alamitos Naval Air Station.

In the instance of Option A (the Segerstrom proposal), the following conditions apply:

1. The Segerstrom alternative shall be pursued only if the Los Alamitos alternative does not acceptably materialize.

2. A minimum of three independent appraisals shall be obtained, with the advice and assistance of the Federal government, to substantiate the reasonableness of the Segerstrom rentals. Great care must be taken to ensure the comparability of appraisal criteria.

SI appraisal

7-14-70
Coldwell Banker
[illegible] letter

3. The lease shall be renegotiated, with the advice and assistance of the Federal government, and subject to prior Office of Education approval.

Drake letter
7-6

4. The relative merits of a long-term lease vs a "limited purchase" shall be further explored and examined, with particular attention paid to income and property tax considerations.

Henry letter

[illegible] defender [illegible] purchase' [illegible] management [illegible]

5. The concept of "construction management" shall be further examined and cleared with the General Counsel. Any contract for construction management services must be subject to prior Office of Education approval.

In the instance of Option B (the Los Alamitos property), the following alternative conditions apply:

1. The Laboratory shall work cooperatively with the Federal government to further explore the Los Alamitos site identified by the Facilities Engineering and Construction Agency. Representatives of the SWRL executive directorship and Board shall visit the site and rule on its acceptability relative to the established SWRL site criteria.

Bd. meeting
8-11-70

2. Design work which is not specific to either option may proceed within the constraints of the applicable terms and conditions of the prospective grant award.

[illegible]
7-1

3. The Laboratory shall submit its written position on the Los Alamitos site to the Office of Education for review by staff and, possibly, consultants.

4. Considerations of alternative properties shall be limited to the Los Alamitos site, and shall require no more than 90 days. If the Los Alamitos property has not been found acceptable and secured (for construction purposes) within this time, the Laboratory will be authorized to proceed with the Segerstrom alternative.

Federal participation in funding this project has been recommended to be as follows in light of the conditions stated above:

Line - Item	Option A	Option B
Acquisition of land and building	$2,700,000	-
Preliminary site clearance	-	Incl. in "Reserv
Surveys and Testing	7,500	Incl. in "Reserv
Architectural fees	191,000	191,000
Resident inspection	15,000	Incl. in "Reserv
Construction		
Shell	-	1,600,000
Interior Improvements	428,340	428,340
Built-in equipment		
Building Systems	463,310	463,310
Other Built-in	123,050	123,050
Site improvement/utility connections	-	200,000
Construction Contingency	70,000	197,000
Legal/administrative	12,800	12,800
Movable equipment	275,000	312,500
Undistributed Reserve	-	758,000
TOTAL	$4,286,000	$4,286,000

If any questions should arise regarding this letter of approval, please do not hesitate to call. Mr. Jacob Maimone, the prospective Grants Officer, and I will be in further contact with you, as the institutional representative designated in the proposal, and will initiate the action necessary to effect an agreement between the respective parties.

Sincerely yours,

Ernest W. Michelsen

Ernest W. Michelsen
Acting Director
Division of Educational Laboratories

Attachment 21. Architect's Agreement - Standard Form

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document B331

The Standard Form of Agreement Between The Owner and The Architect

on a basis of

Professional Fee Plus Expenses

AGREEMENT

made this day of in the year of Nineteen Hundred and

BETWEEN

the Owner, and

the Architect.

It is the intention of the Owner to

hereinafter referred to as the Project.

The Owner and the Architect agree as set forth below.

©1967 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASH., D.C. 20006

I. **THE ARCHITECT** shall provide professional services for the Project in accordance with the Terms and Conditions of this Agreement.

II. **THE OWNER** shall compensate the Architect, in accordance with the Terms and Conditions of this Agreement, as follows:

a. *FOR THE ARCHITECT'S BASIC SERVICES,* as described in Paragraph 1.1, a Professional Fee of

dollars ($). If the scope of the Project is changed materially, the Professional Fee shall be changed in the same proportion. If Additional Services, as described in Paragraph 1.3, are required, the Professional Fee shall be adjusted by mutual consent.

b. *FOR THE ARCHITECT'S BASIC AND ADDITIONAL SERVICES,* as described in Paragraphs 1.1 and 1.3, a sum computed as follows:

Principals' time at the fixed rate of dollars ($) per hour. For the purposes of this Agreement, the Principals are:

Employees' time computed at a multiple of ( ) times the employees' Direct Personnel Expense as defined in Article 4.

Services of professional consultants engaged for the normal structural, mechanical and electrical engineering services at a multiple of ( ) times the amount billed to the Architect for such services.

c. *FOR THE ARCHITECT'S REIMBURSABLE EXPENSES,* amounts expended as defined in Article 5.

d. *THE TIMES AND FURTHER CONDITIONS OF PAYMENT* shall be as described in Article 6.

©1967 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASH., D.C. 20006

TERMS AND CONDITIONS OF AGREEMENT BETWEEN OWNER AND ARCHITECT

ARTICLE 1

ARCHITECT'S SERVICES

1.1 BASIC SERVICES

The Architect's Basic Services consist of the five phases described below and include normal structural, mechanical and electrical engineering services.

SCHEMATIC DESIGN PHASE

1.1.1 The Architect shall consult with the Owner to ascertain the requirements of the Project and shall confirm such requirements to the Owner.

1.1.2 The Architect shall prepare Schematic Design Studies consisting of drawings and other documents illustrating the scale and relationship of Project components for approval by the Owner.

1.1.3 The Architect shall submit to the Owner a Statement of Probable Construction Cost based on current area, volume or other unit costs.

DESIGN DEVELOPMENT PHASE

1.1.4 The Architect shall prepare from the approved Schematic Design Studies, for approval by the Owner, the Design Development Documents consisting of drawings and other documents to fix and describe the size and character of the entire Project as to materials, structure, mechanical and electrical systems, and such other essentials as may be appropriate.

1.1.5 The Architect shall submit to the Owner a further Statement of Probable Construction Cost.

CONSTRUCTION DOCUMENTS PHASE

1.1.6 The Architect shall prepare from the approved Design Development Documents, for approval by the Owner, Working Drawings and Specifications setting forth in detail the requirements for the construction of the entire Project including the necessary bidding information, and shall assist in the preparation of bidding forms, the Conditions of the Contract, and the form of Agreement between the Owner and the Contractor.

1.1.7 The Architect shall advise the Owner of any adjustments to previous Statements of Probable Construction Cost indicated by changes in requirements or general market conditions.

1.1.8 The Architect shall assist the Owner in filing the required documents for the approval of governmental authorities having jurisdiction over the Project.

BIDDING OR NEGOTIATION PHASE

1.1.9 The Architect, following the Owner's approval of the Construction Documents and of the latest Statement of Probable Construction Cost, shall assist the Owner in obtaining bids or negotiated proposals, and in awarding and preparing construction contracts.

CONSTRUCTION PHASE — ADMINISTRATION OF THE CONSTRUCTION CONTRACT

1.1.10 The Construction Phase will commence with the award of the Construction Contract and will terminate when final payment is made by the Owner to the Contractor.

1.1.11 The Architect shall provide Administration of the Construction Contract as set forth in Articles 1 through 14 inclusive of the latest edition of AIA Document A201, General Conditions of the Contract for Construction, and the extent of his duties and responsibilities and the limitations of his authority as assigned thereunder shall not be modified without his written consent.

1.1.12 The Architect, as the representative of the Owner during the Construction Phase, shall advise and consult with the Owner, and all of the Owner's instructions to the Contractor shall be issued through the Architect. The Architect shall have authority to act on behalf of the Owner to the extent provided in the General Conditions unless otherwise modified in writing.

1.1.13 The Architect shall at all times have access to the Work wherever it is in preparation or progress.

1.1.14 The Architect shall make periodic visits to the site to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. On the basis of his on-site observations as an architect, he shall endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor. The Architect shall not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect shall not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

1.1.15 Based on such observations at the site and on the Contractor's Application for Payment, the Architect shall determine the amount owing to the Contractor and shall issue Certificates for Payment in such amounts. The issuance of a Certificate for Payment shall constitute a representation by the Architect to the Owner, based on his observations at the site as provided in Subparagraph 1.1.14 and the data comprising the Application for Payment, that the work has progressed to the point indicated; that to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole upon Substantial Completion, to the results of any subsequent tests required by the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion,

©1967 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASH., D.C. 20006

and to any specific qualifications stated in his Certificate); and that the Contractor is entitled to payment in the amount certified. By issuing a Certificate for Payment, the Architect shall not be deemed to represent that he has made any examination to ascertain how and for what purpose the Contractor has used the moneys paid on account of the Contract Sum.

1.1.16 The Architect shall be, in the first instance, the interpreter of the requirements of the Contract Documents and the impartial judge of the performance thereunder by both the Owner and Contractor. The Architect shall make decisions on all claims of the Owner or Contractor relating to the execution and progress of the Work and on all other matters or questions related thereto. The Architect's decisions in matters relating to artistic effect shall be final if consistent with the intent of the Contract Documents.

1.1.17 The Architect shall have authority to reject Work which does not conform to the Contract Documents. The Architect shall also have authority to require the Contractor to stop the Work whenever in his reasonable opinion it may be necessary for the proper performance of the Contract. The Architect shall not be liable to the Owner for the consequences of any decision made by him in good faith either to exercise or not to exercise his authority to stop the Work.

1.1.18 The Architect shall review and approve shop drawings, samples, and other submissions of the Contractor only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents.

1.1.19 The Architect shall prepare Change Orders.

1.1.20 The Architect shall conduct inspections to determine the Dates of Substantial Completion and Final Completion, shall receive written guarantees and related documents assembled by the Contractor, and shall issue a final Certificate for Payment.

1.1.21 The Architect shall not be responsible for the acts or omissions of the Contractor, or any Subcontractors, or any of the Contractor's or Subcontractors' agents or employees, or any other persons performing any of the Work.

1.2 PROJECT REPRESENTATION BEYOND BASIC SERVICES

1.2.1 If more extensive representation at the site than is described under Subparagraphs 1.1.10 through 1.1.21 inclusive is required, and if the Owner and Architect agree, the Architect shall provide one or more Full-time Project Representatives to assist the Architect.

1.2.2 Such Full-time Project Representatives shall be selected, employed and directed by the Architect, and the Architect shall be compensated therefor as mutually agreed between the Owner and the Architect as set forth in an exhibit appended to this Agreement.

1.2.3 The duties, responsibilities and limitations of such Full-time Project Representatives shall be as set forth in an exhibit appended to this Agreement.

1.2.4 Through the on-site observations by Full-time Project Representatives of the Work in progress, the Architect shall endeavor to provide further protection for the Owner against defects in the Work, but the furnishing of such project representation shall not make the Architect responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

1.3 ADDITIONAL SERVICES

The following services are not covered in Paragraphs 1.1 or 1.2. If any of these Additional Services are authorized by the Owner, they shall be paid for by Owner as hereinbefore provided.

1.3.1 Providing special analyses of the Owner's needs, and programming the requirements of the Project.

1.3.2 Providing financial feasibility or other special studies.

1.3.3 Providing planning surveys, site evaluations, or comparative studies of prospective sites.

1.3.4 Making measured drawings of existing construction when required for planning additions or alterations thereto.

1.3.5 Revising previously approved Drawings, Specifications or other documents to accomplish changes not initiated by the Architect.

1.3.6 Preparing documents for alternate bids requested by the Owner.

1.3.7 Providing Detailed Estimates of Construction Costs.

1.3.8 Providing consultation concerning replacement of any Work damaged by fire or other cause during construction, and furnishing professional services of the type set forth in Paragraph 1.1 as may be required in connection with the replacement of such Work.

1.3.9 Providing professional services made necessary by the default of the Contractor in the performance of the Construction Contract.

1.3.10 Providing Contract Administration and observation of construction after the Contract Time has been exceeded by more than twenty per cent through no fault of the Architect.

1.3.11 Furnishing the Owner a set of reproducible record prints of drawings showing significant changes made during the construction process, based on marked up prints, drawings and other data furnished by the Contractor to the Architect.

1.3.12 Providing services after final payment to the Contractor.

1.3.13 Providing interior design and other services required for or in connection with the selection of furniture and furnishings.

1.3.14 Providing services as an expert witness in connection with any public hearing, arbitration proceeding, or the proceedings of a court of record.

1.3.15 Providing services for planning tenant or rental spaces.

ARTICLE 2
THE OWNER'S RESPONSIBILITIES

2.1 The Owner shall provide full information regarding his requirements for the Project.

2.2 The Owner shall designate, when necessary, a representative authorized to act in his behalf with respect to the Project. The Owner or his representative shall examine documents submitted by the Architect and shall render decisions pertaining thereto promptly, to avoid unreasonable delay in the progress of the Architect's work.

2.3 The Owner shall furnish a certified land survey of the site giving, as applicable, grades and lines of streets, alleys, pavements, and adjoining property; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and complete data pertaining to existing buildings, other improvements and trees; and full information concerning available service and utility lines both public and private.

2.4 The Owner shall furnish the services of a soils engineer, when such services are deemed necessary by the Architect, including reports, test borings, test pits, soil bearing values and other necessary operations for determining subsoil conditions.

2.5 The Owner shall furnish structural, mechanical, chemical and other laboratory tests, inspections and reports as required by law or the Contract Documents.

2.6 The Owner shall furnish such legal, accounting and insurance counselling services as may be necessary for the Project and such auditing services as he may require to ascertain how or for what purposes the Contractor has used the moneys paid to him under the Construction Contract.

2.7 The services, information, surveys and reports required by Paragraphs 2.3 through 2.6 inclusive shall be furnished at the Owner's expense, and the Architect shall be entitled to rely upon the accuracy thereof.

2.8 If the Owner observes or otherwise becomes aware of any fault or defect in the Project or non-conformance with the Contract Documents, he shall give prompt written notice thereof to the Architect.

2.9 The Owner shall furnish information required of him as expeditiously as necessary for the orderly progress of the Work.

ARTICLE 3
CONSTRUCTION COST

3.1 Construction Cost shall be determined as follows, with precedence in the order listed:

3.1.1 For completed construction, the total cost of all such Work;

3.1.2 For Work not constructed, the lowest bona fide bid received from a qualified bidder for any or all of such work; or

3.1.3 For work for which bids are not received, (1) the latest Detailed Cost Estimate, or (2) the Architect's latest Statement of Probable Construction Cost.

3.2 Construction Cost does not include the fees of the Architect and consultants, the cost of the land, rights-of-way, or other costs which are the responsibility of the Owner as provided in Paragraphs 2.3 through 2.6 inclusive.

3.3 Labor furnished by the Owner for the Project shall be included in the Construction Cost at current market rates. Materials and equipment furnished by the Owner shall be included at current market prices, except that used materials and equipment shall be included as if purchased new for the Project.

3.4 Statements of Probable Construction Cost and Detailed Cost Estimates prepared by the Architect represent his best judgment as a design professional familiar with the construction industry. It is recognized, however, that neither the Architect nor the Owner has any control over the cost of labor, materials or equipment, over the contractors' methods of determining bid prices, or over competitive bidding or market conditions. Accordingly, the Architect cannot and does not guarantee that bids will not vary from any Statement of Probable Construction Cost or other cost estimate prepared by him.

3.5 When a fixed limit of Construction Cost is established as a condition of this Agreement, it shall include a bidding contingency of ten per cent unless another amount is agreed upon in writing. When such a fixed limit is established, the Architect shall be permitted to determine what materials, equipment, component systems and types of construction are to be included in the Contract Documents, and to make reasonable adjustments in the scope of the Project to bring it within the fixed limit. The Architect may also include in the Contract Documents alternate bids to adjust the Construction Cost to the fixed limit.

3.5.1 If the lowest bona fide bid, the Detailed Cost Estimate or the Statement of Probable Construction Cost exceeds such fixed limit of Construction Cost (including the bidding contingency) established as a condition of tihs Agreement, the Owner shall (1) give written approval of an increase in such fixed limit, (2) authorize rebidding the Project within a reasonable time, or (3) cooperate in revising the Project scope and quality as required to reduce the probable cost. In the case of (3) the Architect, without additional charge, shall modify the Drawings and Specifications as necessary to bring the Construction Cost within the fixed limit. The providing of this service shall be the limit of the Architect's responsibility in this regard, and having done so, the Architect shall be entitled to his fees in accordance with this Agreement.

ARTICLE 4
DIRECT PERSONNEL EXPENSE

4.1 Direct Personnel Expense of employees engaged on the Project by the Architect includes architects, engineers, designers, job captains, draftsmen, specification writers and typists, in consultation, research, designing, producing drawings, specifications and other documents pertaining to the Project, and services during construction at the site.

4.2 Direct Personnel Expense includes cost of salaries and of mandatory and customary benefits such as statutory employee benefits, insurance, sick leave, holidays and vacations, pensions and similar benefits.

ARTICLE 5
REIMBURSABLE EXPENSES

5.1 Reimbursable Expenses are in addition to the Professional Fee under Paragraph IIa herein, and to the compensation for Basic and Additional Services under Paragraph IIb herein, and include actual expenditures made by the Architect, his employees, or his consultants in the interest of the Project for the incidental expenses listed in the following Subparagraphs:

5.1.1 Expense of transportation and living when traveling in connection with the Project and for long distance calls and telegrams.

5.1.2 Expense of reproductions, postage and handling of Drawings and Specifications, excluding copies for Architect's office use and duplicate sets at each phase for the Owner's review and approval; and fees paid for securing approval of authorities having jurisdiction over the Project.

5.1.3 If authorized in advance by the Owner, the expense of overtime work requiring higher than regular rates; perspectives or models for the Owner's use; and fees of special consultants for other than the normal structural, mechanical and electrical engineering services.

ARTICLE 6
PAYMENTS TO THE ARCHITECT

6.1 Payments on account of the Architect's Professional Fee shall be made as follows:

6.1.1 An initial payment of ten per cent of the Professional Fee, payable upon execution of this Agreement, is the minimum payment under this Agreement;

6.1.2 Subsequent payments of the Professional Fee shall be made monthly in proportion to services performed to increase the total payments on account of the Professional Fee to the following percentages at the completion of each phase of the Work:

Schematic Design Phase	15%
Design Development Phase	35%
Construction Documents Phase	75%
Bidding and Negotiation Phase	80%
Construction Phase	100%

6.2 Payments for Principals' time, employees' time, and services of professional consultants as provided in Paragraph IIb and for Reimbursable Expenses as defined in Article 5 shall be made monthly upon presentation of the Architect's statement of services rendered.

6.3 No deductions shall be made from the Architect's compensation on account of penalty, liquidated damages, or other sums withheld from payments to contractors.

6.4 If the Project is suspended for more than three months or abandoned in whole or in part, the Architect shall be paid his compensation for services performed prior to receipt of written notice from the Owner of such suspension or abandonment, together with Reimbursable Expenses then due and all terminal expenses resulting from such suspension or abandonment.

ARTICLE 7
ARCHITECT'S ACCOUNTING RECORDS

Records of the Architect's Direct Personnel, Consultant and Reimbursable Expenses pertaining to the Project and records of accounts between the Owner and Contractor shall be kept on a generally recognized accounting basis and shall be available to the Owner or his authorized representative at mutually convenient times.

ARTICLE 8
TERMINATION OF AGREEMENT

This Agreement may be terminated by either party upon seven days' written notice should the other party fail substantially to perform in accordance with its terms through no fault of the other. In the event of termination due to the fault of others than the Architect, the Architect shall be paid his compensation for services performed to termination date, including Reimbursable Expenses then due and all terminal expenses.

ARTICLE 9
OWNERSHIP OF DOCUMENTS

Drawings and Specifications as instruments of service are and shall remain the property of the Architect whether the Project for which they are made is executed or not. They are not to be used by the Owner on other projects or extensions to this Project except by agreement in writing and with appropriate compensation to the Architect.

ARTICLE 10
SUCCESSORS AND ASSIGNS

The Owner and the Architect each binds himself, his partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors, assigns and legal representatives of such other party in respect of all covenants of this Agreement. Neither the Owner nor the Architect shall assign, sublet or transfer his interest in this Agreement without the written consent of the other.

ARTICLE 11
ARBITRATION

11.1 All claims, disputes and other matters in question arising out of, or relating to, this Agreement, or the breach thereof, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining. This agreement so to arbitrate shall be specifically enforceable under the prevailing arbitration law.

11.2 Notice of the demand for arbitration shall be filed in writing with the other party to the contract and with the American Arbitration Association. The demand shall be made within a reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for arbitration be made after institution of legal or equitable proceedings based on

©1967 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASH., D.C. 20006

such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

11.3 The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

ARTICLE 12

EXTENT OF AGREEMENT

This Agreement represents the entire and integrated Agreement between the Owner and the Architect and supersedes all prior negotiations, representations, or agreements either written or oral. This Agreement may be amended only by written instrument signed by both Owner and Architect.

ARTICLE 13

APPLICABLE LAW

Unless otherwise specified, this Agreement shall be governed by the law of the principal place of business of the Architect.

©1967 THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASH., D.C. 20006

This Agreement executed the day and year first written above.

OWNER ______________________________ ARCHITECT ______________________________

Architect's Registration No. ______________________________

Attachment 22. Architect's Agreement - SWRL Project

AGREEMENT

THIS AGREEMENT is entered into on the 29th day of April 1971 by and between the Southwest Regional Laboratory, hereinafter called the Laboratory, and Skidmore, Owings & Merrill, who are duly licensed by law to practice architecture and to perform engineering services in the State of California, hereinafter referred to as the Architect.

WITNESSETH:

THAT, WHEREAS, the Laboratory intends to construct the Project described as follows and hereinafter referred to as the Project: An educational research facility to be located on a 12 acre Naval Air Station site presently owned by the Federal Government at Los Alamitos, California. The project will comprise a total building area of approximately 90,000 square feet and will be two (2) stories in height.

THAT, WHEREAS, the Architect will perform its services in cooperation with Turner Construction Company, whom the Laboratory plans to engage as construction management cousultants, and that the Architect has reviewed the proposed Contract between the Laboratory and Turner Construction Company, hereinafter referred to as the Construction Manager, and will coordinate its services with those of Turner as may be required therein.

THAT, WHEREAS, under Federal Grant OEG-0-70-5079, hereinafter referred to as the "Grant", funds have been provided for the project.

AND WHEREAS, the Architect has signified his willingness to perform all professional services, more specifically described as follows, necessary for completion of the Project in accordance with applicable Public Laws, Ordinances, and Regulations:

ALL ARCHITECTURAL SERVICES, AS DESCRIBED IN ARTICLE VI

NOW, THEREFORE, the Laboratory and Architect, for the considerations hereinafter named, agree as follows:

ARTICLE I
Definitions

Following shall be the definition of terms used throughout the agreement:

Architect	Architect and his Engineers, Landscape Architect or other authorized representatives.

Construction Manager	The Construction Manager shall represent Turner Construction Company and shall serve as Agent for and on behalf of the Laboratory in the performance of the Work.
Laboratory	Southwest Regional Laboratory
Representative of the Laboratory	The Laboratory Director shall represent the Laboratory and shall cooperate with the Architect in all matters pertaining to the services to be rendered under this Agreement so that performance of the work may proceed without undue delay. The Architect shall consult the Laboratory Director on all matters relative to the Agreement.

ARTICLE II
Estimates of Construction Cost

The Agreed Preliminary Estimate of Construction Cost shall be established by agreement between the Architect and the Laboratory. Construction cost estimates shall be prepared after completion of the schematic drawings and upon completion of the working drawings and specifications. In the event that the bids exceed 110% of the final cost estimates, at its own expense the Archtiect will make additional drawings or modifications to working drawings to stay within the 110% limitation.

ARTICLE III
Time Limit for Completion of Schematic Drawings, Preliminary Drawings, and Working Drawings and Specifications

Time shall be considered the essence of this Agreement.

Schematic Drawings and Descriptive Specifications shall be completed within 180 calendar days after receipt by the Architect of the program requirements of the Project.

Preliminary Drawings, Specifications and preliminary estimate of construction cost shall be completed within 90 calendar days after receipt by the Architect of the approval by the Laboratory Director of the Schematic Drawings. The working drawings, computations, and specifications shall be completed within 90 calendar days after Laboratory approval of the preliminary drawings.

The time during which the Architect is delayed in his work by the acts or neglect of the Laboratory or its employees or those under it by Contract or otherwise, or by the Acts of God which the Architect could not reasonably have foreseen and provided for, and which are not caused by or the continuance of which is not due to any fault or neglect on the part of the Architect, or during arbitration of disputes between the Laboratory and the Architect, shall be added to the time period for completion, but the Laboratory shall not be liable for any damages because of any such delay.

ARTICLE IV
Architect's Fee

A. The Laboratory agrees to pay the Architect for his services a fee in the sum of $191,000.

B. For Architect's services outlined in Article VI, subparagraph O., Architects shall receive a sum equal to the actual cost of direct technical labor applied, including Partners at $25.00 per hour, Associate Partners at $20.00 per hour, and including payroll tax expense and allowance for holidays and vacations, plus an allowance of 150 per cent of this amount for overhead and profit and the Architect's usual and customary hourly rate for the time Architect's computer is used in the performance of such services. Technical personnel shall include Partners, when involved in a technical capacity, and all other personnel assigned to the Project, including specification and report typists and electronic computer operators, but exclusive of general office employees such as accountants, bookkeepers, secretaries, stenographers, plan clerks, switchboard operators, and office boys.

C. In addition to the Architect's compensation under Paragraph B, it is to be reimbursed for its actual and reasonable expenses, in connection with the performance of its services for travel, subsistence outside the San Francisco metropolitan area, reproduction of drawings, specifications, reports and other documents, the cost to it for the use of outside computers, long-distance telephone calls and telegrams, shipping and postage charges, presentation equipment and material, any sales, use, occupation or similar taxes applicable to this Agreement or the performance of services hereunder, purchase of area maps, code books, and similar documents, and as authorized by the Laboratory, renderings and models prepared outside the Architect's office, mock-ups and photographs. These costs shall not exceed $13,000 without written approval from the Laboratory.

D. Payment shall be made to the Architect upon its submission to the Laboratory of monthly statements prepared in accordance with Paragraphs B and C, the Architect's billings under Paragraph A to be based upon the schedule shown under paragraph 3.18, Section III, Option B of the Grant, a copy of which is attached.

E. It is understood and agreed by both parties that the reimbursable costs chargeable to this Agreement includes costs incurred from the date of the letter from the Laboratory to the Architect authorizing commencement of these services.

ARTICLE V
The Laboratory's Services

The Laboratory shall provide the following services:

A. Statement of Building Program. Program requirements of the Project which shall list the items to be included.

B. Surveys and Tests. A complete and accurate survey of the building site, grades and lines of streets, utilities, pavements, and boundaries of adjoining properties; complete and accurate information as to all rights-of-way, rights, restrictions, encroachments, zoning, boundaries, and contours of the Project site and adjacent areas; and borings, test pits and chemical, technical, and other tests.

C. The Laboratory shall also furnish auditing services to check Contractor's payment requests, such legal, accounting and insurance counselling services as may be necessary for the Project and the services of special consultants such as may be necessary for the Project.

ARTICLE VI
The Architect's Services

The services to be rendered by the Architect shall consist of all such services as are customarily rendered and shall include the following:

A. Employment of Professional Engineers and Landscape Architect. The Architect shall retain, at his own expense, competent licensed engineers for the structural, electrical, mechanical and civil engineering portions of the project; and if directed by the Laboratory, a competent licensed landscape architect.

B. Program Requirements. Establishment, in consultation with the Laboratory, of program requirements of the Project. Included will be such drawings, studies, and supporting data as may be required.

C. Schematic Drawings. All necessary conferences; preparation of Site Utilization Plan; Schematic Plans and Elevations of buildings leading to a recommended and acceptable solution of the program. The Architect shall inform the Laboratory Director in writing of the estimated cost of construction.

D. Preliminary Drawings. Upon approval by the Laboratory Director of the services set forth in Paragraph C, the Architect shall prepare Preliminary Drawings, Structural Design, Specifications and obtain an Estimate of Construction Cost; and all revisions thereof required by the Laboratory.

E. Final Working Drawings and Specifications. Upon approval by the Laboratory of services set forth in Paragraph D, the Architect shall prepare one set of construction documents, including working drawings and specifications for architectural, structural, mechanical, electrical, civil, and landscape work, and approve a final estimate of construction costs. These working drawings and specifications will cover the complete building, all utilities, and all equipment built into the building or requiring actual mechanical connection thereto.

The construction documents shall consist of a complete and accurate set of the following in such form as will enable (1) the Architect to secure the required approvals thereof by public authorities having jurisdiction, (2) the Laboratory to secure required permits for construction of the project, and (3) any competent Contractor to perform the construction.

Architectural Drawings
Engineering Drawings (Structural, Mechanical, Electrical, and Civil)
Landscape Drawings
Specifications

The Final Drawings shall be drawn in pencil on Clear Print 1000H. Drawing Paper; be of such quality and workmanship that clear and legible duplicate tracings or prints may be obtained therefrom; and be uniform in size, the sheet size to be approved by the Laboratory Director.

F. Shop Drawings and Samples. The processing of all shop drawings and material samples, in accordance with the provisions of paragraph .07 of the Special Conditions of each construction contract.

G. Reproduction of Documents During Production. The Architect shall furnish for the use of his Engineers and to the Laboratory for study and checking, required copies of the preliminary drawings, specifications, and estimate.

When working drawings and specifications have been completed and are ready to file with the Public Authorities, the Architect shall furnish the Laboratory with three clear and legible copies of structural computations and three sets of the working specifications.

H. Reports. Making reports to the Laboratory, as required, on the progress of the work on preliminary or working drawings and specifications.

The Architect and his Engineers shall, on the basis of his periodic on-site observations, submit Verified Progress Reports, as required, simultaneously to the Laboratory and the State Division of Architecture, Department of Public Works, State of California, in compliance with Section 38, Title 21, Public Works, California Administrative Code.

I. After the Laboratory's approval of final construction documents, the Construction Manager will undertake the solicitation and analysis of competitive bids from construction contractors selected in consultation with the Laboratory; and will advise the Laboratory on recommendations for the award of the Construction Contract, and will assist in the preparation of the construction contracts. The Architect will assist the Laboratory and the Construction Manager in the selection of construction contractors to be invited to submit competitive bids and review and consult with the Construction Manager on recommendations for award.

J. Services During Construction. During construction, the Architect shall at least once a month make periodic on-site observations of the general quality and progress of the Work for general conformance with the Contract Documents; and based upon such observations and a general overview of the contractor's application for payment, shall issue a Certificate of Payment. The Architect shall also perform pre-final and final inspections of the constructed facility as provided for in the construction documents. This effort is not to exceed 24 man days. It is understood that the Laboratory will include in the construction contract, the clause contained in the Architect's standard general conditions for construction contracts.

K. Change Orders. Processing of all Change Orders required under the Construction Contract.

L. Selection of Colors, Texture and Finishes. Prepare and submit for approval of the Laboratory selections of colors, textures, and finishes for all required items of the Project, in ample time before such information is needed by the Contractor.

M. Contract Payment Certificate. The Architect shall examine, and when found to be correct and satisfactory, approve each Contract Payment Request.

N. As-Built Drawings. As the construction of the Project progresses and not later than 30 days after the completion thereof, the Architect shall correct the final working drawings, indicating all changes made by Change Orders under the construction contract and all information shown on the record drawings as called for in the specifications, producing an "As-Built" set of drawings.

On approval by the Laboratory of the completed As-Built Drawings, the Architect shall furnish to the Laboratory a set of half-size duplicate tracings of the drawings. The process, method and material shall be as determined by the Laboratory. The tracings to be of such quality that clear and legible prints may be made therefrom without appreciable or objectionable loss of detail.

O. Extra Services. To the extent requested in writing by the Laboratory Director, supplemental services shall be provided in addition to those outlined above as follows:

1. Preparation of drawings and specifications out of normal sequence.

2. Preparation of more than one set of bid documents.

3. Interior design, including selection of graphics, design or selection of furniture, furnishings, accessories, sculpture, murals, and other related features and special equipment, preparation of preliminary and final drawings and specifications and cost estimates, coordination of purchasing and installation and such other related services as may be agreed upon.

4. Preparation of additional drawings or modifications to working drawings to effect cost reductions other than those which would be required to reduce the cost of the Project to within 110% of the final cost estimate.

5. Preparation for and/or appearance on the Laboratory's behalf in connection with any litigation or any zoning, building code or other dispute respecting the Project.

6. After acceptance or occupancy (whichever first occurs) of the Project or any part thereof by Architects or others representing or under contract to Architects either directly or indirectly, consultation in connection with the operation and maintenance of the building and of its various mechanical and electrical systems and components.

7. The performance of services in addition to those contemplated hereby by the reason of changes ordered by Laboratory or for any other reason beyond Architect's control, including, but not limited to, extra work involved in changes or proposed changes in scope, complexity, size or nature of the project or in preliminary or final documents which have been approved by Architects, revisions to occupant or tenant standards or installations, extensions of the period of construction, through no fault of the Architect, by more than 20 per cent beyond the completion date initially established in the construction contract, or because of delinquency or insolvency or defects or deficiencies in the work or products of the Contractor or any of the Subcontractors, suppliers or manufacturers, or damage to the project by fire or casualty.

8. Performance of services for any work which is off-site.

P. Responsibility. Although in the performance of his services, the Architect will endeavor to use reasonable care in applying his professional skills, he will not guarantee to be responsible for the performance of the Contract, work or products, or any defects resulting therefrom, or any Contractor, Subcontractor, manufacturer, supplier, or fabricator or any consultant retained by the Laboratory. Nothing in this Agreement shall be construed as giving the Architect the responsibility for or the authority to direct or supervise construction methods, techniques, procedures, or safety measures or programs.

The Architect will perform without expense to the Laboratory such professional architect-engineer services as may be required to correct or remedy any error, omission or negligent act of his.

ARTICLE VII
Termination

Either the Laboratory or the Architect shall have the right at any time hereafter to terminate this Agreement upon 30 days written notice should the other party fail substantially to perform in accordance with its terms through no fault of the other. In the event of such termination by the Architect for reasons due to the fault of others, the Architect is to receive and accept, as full payment for his services performed prior to such termination, the amounts earned under Article IV hereof as of the date the Architect shall give notice.

ARTICLE VIII
Partial Suspension or Abandonment of Project

The Laboratory may suspend or abandon a portion of the Project contemplated under this Agreement and amend the agreement accordingly. Such abandonment or suspension shall in no way make void or invalidate the Agreement. The payment provisions under Article VII shall apply to the portion so suspended or abandoned.

ARTICLE IX
Ownership of Documents Prepared by Architect

All drawings and specifications prepared by the Architect shall remain his property. The Architect will, however, upon the Laboratory's request, supply it at its expense with negatives for making reproductions of all architectural and engineering drawings reasonably specified in such request and with one set of specifications for use only in connection with the project.

ARTICLE X
Workmen's Compensation Insurance

The Architect shall maintain such insurance as will protect him from claims under Workmen's Compensation Insurance Acts.

ARTICLE XI
Architect Not Officer, Employee or Agent of Laboratory

While engaged in carrying out and complying with the terms and conditions of this Agreement, the Architect is an independent contractor and not an officer, employee, or agent of the Laboratory.

ARTICLE XII
Assignment of Agreement

The Architect shall not assign or transfer by operation of law, or otherwise, any or all of his rights, burdens, duties or obligations without the prior written consent of the Laboratory. A change in the membership of one or more partners of the Architect firm shall not constitute an assignment.

ARTICLE XIII
Arbitration

ll claims, disputes and other matters in question arising out of, or relating to, his Agreement, or the breach thereof, shall be decided by arbitration in accordance ith the Construction Industry Arbitration Rules of the American Arbitration Association hen obtaining. This Agreement so to arbitrate shall be specifically enforceable under he prevailing law.

Notice of the demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The demand shall be made within a reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for arbitration be made after institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

ARTICLE XIV
General Provisions

Subparagraphs a, b, c, of paragraph 4, of the Special Conditions of the Grant are incorporated herein as part of this Agreement.

The Equal Employment Opportunity Provision described in paragraph 3.09, Section III, Option B, of the Grant is incorporated herein as part of this Agreement.

The Government or any duly authorized representative, shall, until the expiration of five years after final payment under this Agreement, have access to and the right to examine any directly pertinent books, documents, papers and records of the Architect, involving transactions related to the Agreement.

IN WITNESS WHEREOF the Southwest Regional Laboratory has caused this Agreement to be executed in its behalf by its duly authorized officers, and the Architect has executed this Agreement, the day and year first above written.

ARCHITECT

By

LABORATORY

By

Dir of Bus Ofc

161

Attachment 23. Responses to Project Officer's Questions Regarding Architect and Construction Manager's Contracts

SWRL

SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT
4665 LAMPSON AVENUE LOS ALAMITOS CALIFORNIA 90720 TELEPHONE 598-7661 AREA CODE 213

March 12, 1971

Mr. Howard F. Perry
Chief, Research Facilities Staff
Office of the Director, DMI
U. S. Office of Education
Washington, D. C.   20202

Dear Howard:

I am writing in response to your letter of February 2, 1971, concerning our proposed contracts with Turner Construction Company and Skidmore, Owings & Merrill. Your comments were most helpful in trying to finalize the agreements in a manner which would be acceptable to all parties. Each recommendation and/or suggestion included in your letter is shown below (underlined) along with the Laboratory's position toward incorporating it into the contracts.

A. Architectural (Skidmore) Contract

1. It is not at all clear why AIA B331, or some other professionally accepted A/E contract, cannot be used on this project.

   COMMENT:

   The proposed contract is in general conformance with AIA B331. SOM is willing to make any reasonable changes in order to satisfy the Laboratory and/or the Federal Government.

2. The site description on page 1 of the contract can now be limited to Los Alamitos; the uncertainty regarding site-specific construction costs has also been resolved.

   COMMENT:

   The site description in the Agreement has been limited to Los Alamitos.

3. In accordance with the project grant and accepted practice, the architect should redesign the project at his own expense if the bids exceed 110% of the final cost estimates.

COMMENT:

Article II of the Agreement requires the Architect to redesign the building at his own expense if the bids exceed 110% of the final cost estimates.

4. Will cost estimates be prepared by Skidmore with the assistance of the construction manager? or by the construction manager? The proposed contract implies the former.

COMMENT:

The Architect is responsible for approving the cost estimates as indicated in Article VI, Paragraph E of the Agreement. Turner will be responsible for most of the preparation.

5. The contract should stipulate the provision of additional sets of bid documents at a fixed cost per set.

COMMENT:

Article VI, Paragraph P, Subparagraph 2 of the Agreement, provides that the preparation of additional sets of bid documents shall not exceed $75.00 per set.

6. Approval, rather than simply review, of shop drawings and materials samples should be explicitly required.

COMMENT:

It is normal practice in the Los Angeles area to only require the architect to check and review shop drawings. This has been the practice of the Los Angeles School District in the past and will be again in the future. Also, it is the opinion of the Laboratory's Legal Counsel that by requiring the Architect to only review the drawings rather than approve does not lessen his liability to the Laboratory to any great extent.

7. The relationship between Skidmore and the construction manager in ensuring the faithful implementation of the construction documents and rejecting unacceptable work must be made very explicit; further, the role of the full-time resident inspector must be defined; this three-party interface is critical.

COMMENT:

The Architect and Construction Manager have the authority and responsibility for ensuring that all work conforms to the architect's plans and specifications. The relationship between the Architect, Construction Manager and Contractor are fully delineated in the Contract Documents.

8. The following "supplemental services" are unallowable and/or would appear to be unnecessary:

   a. promotion, publicity, etc.;
   b. preparation of funding applications, etc.;
   c. preparation of standards, layouts, drawings, specifications, etc. for tenants;
   d. services in connection with separate commencements of construction (fast-tracking is now out, presumably).

COMMENT:

All reference to the above items have been deleted from the Agreement.

9. In addition, the following "supplemental services" should be part of the basic services provided under the lump sum fee of $191,000:

   a. selection of interior finish material;
   b. preparation of drawings to effect cost reductions.

COMMENT:

The selection of interior finish material is part of the Architect's basic services. This work is provided for in Article VI, paragraph L of the Agreement.

Preparation of drawings to reduce the cost of the facility to within 110% of the final cost estimates will be at the Architect's own expense. Other drawings to effect cost reductions will be prepared at additional cost to the Laboratory. This is covered under Article VI, Paragraph P, Subparagraph 5 of the Agreement.

10. The very broad disclaimer of responsibility in paragraph 1c of the proposed contract is unacceptable; although the right of the architect to protect himself against being held accountable for contractor nonperformance is indisputable, he must be held accountable for his own performance or non-performance.

COMMENT:

The Laboratory's Legal Counsel has examined this paragraph (See Article VI, Paragraph Q) and modified it somewhat. In its present form the Architect is accountable to the Laboratory for any performance or non-performance of his services. However, the Architect's liability is limited to providing the architect-engineer services necessary to correct any error of his. It is felt that this is a reasonable disclaimer.

11. It has been our understanding that overtime work is to be performed within the lump sum fee; this has been advanced in justification of the rather high fee.

COMMENT:

The Architect will perform all the services shown in Article VI of the Agreement on a lump sum basis. Any overtime incurred would be at his expense.

The reference to the rather high fee that the Architect is receiving is somewhat interesting. For a job of similar size and services, the Los Angeles School District would pay a fee of about 7.1% of the cost of construction. This means they would pay approximately $234,000 for this job as opposed to the $191,000 that the Laboratory is paying.

12. The "Additional Services and Changes" section should be consolidated with "Supplemental Services," and the reference to a higher fee in the event of multiple construction contracts deleted.

COMMENT:

These suggestions have been incorporated into the Agreement.

13. SWRL should retain the prerogative of determining the percentage of completion for purposes of paying the architect.

COMMENT:

The Architect will be paid for his services in accordance with the schedule specified in the Grant. This is provided for under Article VI, Paragraph D, of the Agreement.

14. The termination clause should stipulate a minimum period of written notice, should provide for compensation for work performed only if termination is due to the fault of others, and need not address the problems of excessive construction cost.

COMMENT:

Article VII of the Agreement provides that either party may terminate upon 30 days written notice in the event the other party fails to perform. Thus, the Laboratory is protected from an unwarranted termination of the agreement by the Architect. A clause prohibiting the Architect from receiving any compensation for his services should he terminate without cause, would be unenforceable.

15. Arbitration procedures should be stipulated as, for example, in AIA B331; assignees, partners, successors, and legal representatives should be explicitly bound to the agreement.

COMMENT:

Arbitration procedures have been incorporated into the Agreement under Article XIII.

16. The provisions of the project grant, especially paragraph 4 of the Special Conditions, should be incorporated either specifically or by reference.

COMMENT:

The applicable provisions of the Grant have been incorporated into the Agreement under Article XIV.

17. "Periodic site observation" should be at least once a month, and the architect should participate in the pre-final and final inspections of the constructed facility.

COMMENT:

The Architect will make periodic site observations of at least once a month and participate in the pre-final, and final inspections of the constructed facility as provided for under Article VI, Paragraph J of the Agreement.

B. Construction Manager (Turner) Contract

1. As an agent of the Laboratory, does Turner only have the right to consult with the architect, or can he recommend? require?

COMMENT:

Turner has the right to consult with the Architect. The term "consult" used in this context implies recommend as well. Turner does not have authority to direct the Architect.

2. Who assumes responsibility for the credibility of the cost estimates developed by Turner? Recall that the architect must redesign the facility at his own expense if the bids exceed 110% of the final estimates.

COMMENT:

The cost estimates prepared by Turner are approved by the Architect.

3. The drawings and specifications should be reviewed from the standpoint of cost-effectiveness (quality, function, economy) rather than simply economy.

COMMENT:

Turner will be reviewing the drawings and specifications from the standpoint of cost-effectiveness as provided for under Article I, Paragraph b of the Agreement.

4. The bidding process must be subject to the approval not only of the Laboratory, but also of the Federal Government.

COMMENT:

It is recognized that the bidding process is subject to the approval of the Federal Government. This approval will be obtained before any contracts are let.

5. Turner should consult with the architect in making recommendations to SWRL for construction contract awards.

COMMENT:

Turner will consult with the Architect prior to making recommendations to the Laboratory for construction contract awards. (See attached letter from Turner Construction, dated February 23, 1971.)

6. No construction contracts can be awarded until all portions of the work have been bid; this will preserve the option of making qualitative and/or quantitative trade-offs.

   COMMENT:

   No construction contracts will be awarded until all portions of the work have been bid. This is provided for under Article I, Paragraph d of the Agreement.

7. How will the roles of Turner and Skidmore interface in approving payment to the contractors? in ensuring the implementation of Skidmore's plans and specifications? This must be explicitly spelled out.

   COMMENT:

   Turner and SOM will be required to approve all contractor payment requests. Both are also responsible for ensuring that the architect's plans and specifications are properly implemented (See contract documents).

8. The necessity for granting Turner the authority to purchase items or services costing up to $2,000 is not clear. What kinds of purchases might be involved? from what funds? should a more restrictive ceiling be set?

   COMMENT:

   It is desirable to permit Turner to purchase those items or services which are essential to the project and will not be provided by a subcontractor. These purchases could be for lumber for safety barriers, sealant for floors, trailor hauling services, etc. If Turner is not allowed to have this flexibility it could result in serious and unnecessary delays to the project. Expenditures of this nature would be classified as part of the construction cost. Article II of the Agreement limits the cumulative total of these expenditures to $25,000 without written approval of the Laboratory.

9. Although the Turner fee is proposed to be 3 1/2% of "project cost," this term is not defined in the contract. Moreover, the fee should now be fixed as a lump sum based upon the design development cost estimates. Further, any changes in the work initiated by SWRL because of construction manager nonperformance, e.g., inaccurate cost estimating, should not lead to an increase in the construction management fee.

COMMENT:

Under Article III of the Agreement, Turner will receive 3 1/2 per cent of the final estimated construction costs as their fee. However, in the event there is a material difference between estimated and actual construction costs, Turner's fee would be reduced.

10. Turner should participate with the architect in the pre-final and final inspections of the constructed facility.

COMMENT:

Turner will participate with the Architect in the pre-final and final inspections of the facility as provided for in Article I, Paragraph J of the Agreement.

11. In the event of termination, Turner should receive payment for services performed and expenses incurred only if such termination is due to the fault of others.

COMMENT:

Under the Agreement, only the Laboratory has the right to terminate. If the Agreement was terminated due to Turner's non-performance, the Laboratory would have a Cause of Action against Turner. A clause which penalized Turner for non-performance would not be enforceable.

If you wish to discuss any of the above points further, please let me know.

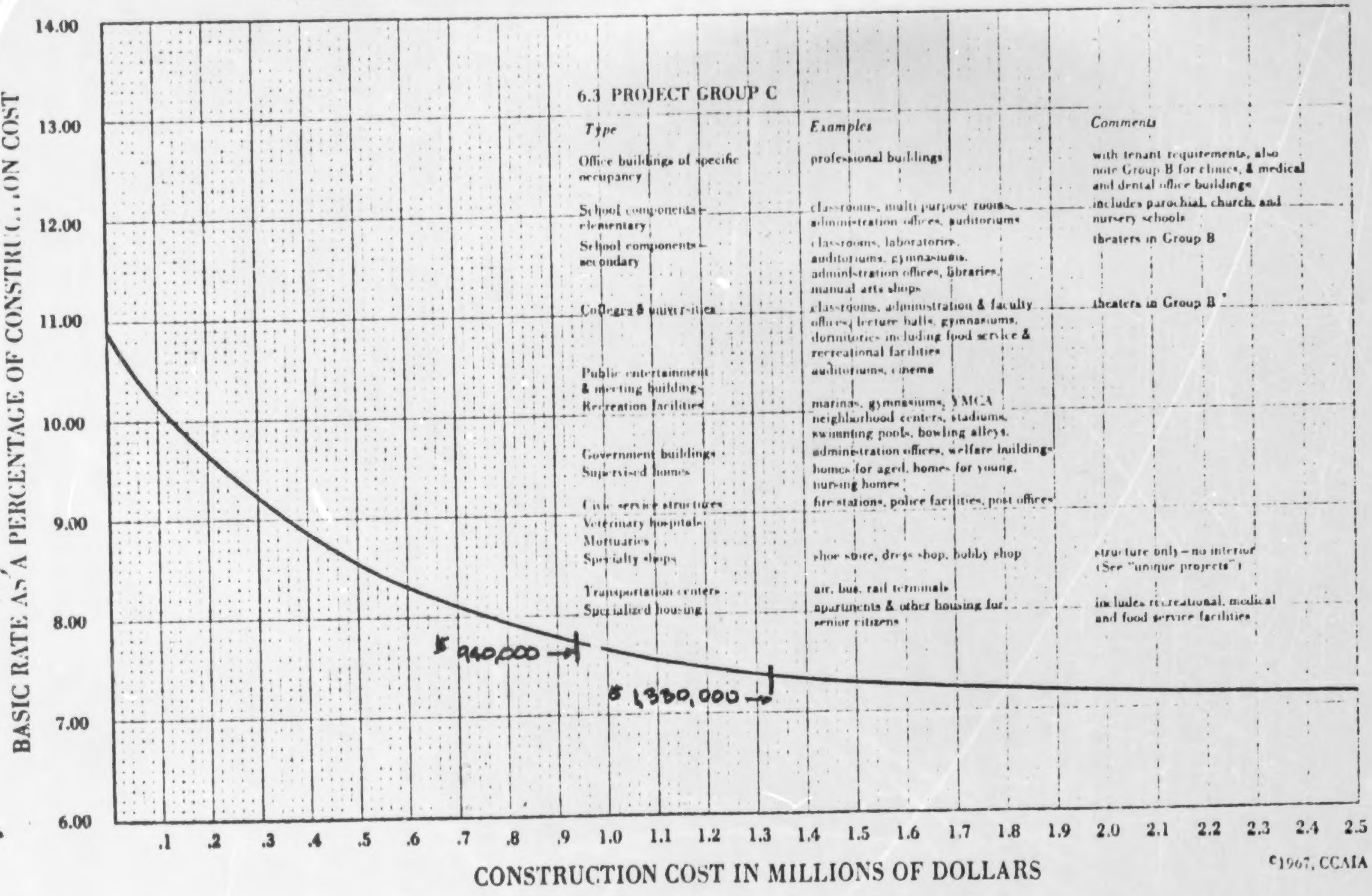
Sincerely,

Robert L. Christensen
Business Manager

RLC:mp
Attachment

Attachment 24. Architect's Fee Schedules

CALIFORNIA RANGE OF COMPENSATION FOR BASIC ARCHITECTURAL SERVICES



6.3 PROJECT GROUP C

Type	*Examples*	*Comments*
Office buildings of specific occupancy	professional buildings	with tenant requirements, also note Group B for clinics, & medical and dental office buildings
School components—elementary	classrooms, multi purpose rooms, administration offices, auditoriums	includes parochial, church, and nursery schools
School components—secondary	classrooms, laboratories, auditoriums, gymnasiums, administration offices, libraries, manual arts shops	theaters in Group B
Colleges & universities	classrooms, administration & faculty offices, lecture halls, gymnasiums, dormitories including food service & recreational facilities	theaters in Group B
Public entertainment & meeting buildings	auditoriums, cinema	
Recreation facilities	marinas, gymnasiums, YMCA neighborhood centers, stadiums, swimming pools, bowling alleys.	
Government buildings	administration offices, welfare buildings	
Supervised homes	homes for aged, homes for young, nursing homes	
Civic service structures	fire stations, police facilities, post offices	
Veterinary hospitals		
Mortuaries		
Specialty shops	shoe store, dress shop, hobby shop	structure only – no interior (See "unique projects")
Transportation centers	air, bus, rail terminals	
Specialized housing	apartments & other housing for senior citizens	includes recreational, medical and food service facilities

©1967, CCAIA

Attachment 25. Architect's Progress Report

Skidmore, Owings & Merrill ARCHITECTS/ENGINEERS

ONE MARITIME PLAZA
SAN FRANCISCO, CALIFORNIA 94

October 21, 1970

Mr. William Hein
Southwest Regional Laboratory
11300 La Cienega Boulevard
Inglewood, California 90304

Subject: Southwest Regional Laboratory
Status Report

Dear Bill:

Enclosed herewith is the Status Report which will supercede the report forwarded to you on October 16, 1970. This report has been revised to include the Audio-Visual Consultants.

Sincerely,

SKIDMORE, OWINGS & MERRILL

Anthony A. Braccia

AAB/aem
Enc.

STATUS REPORT

October 21, 1970

Architect/Engineer (Progress to Date)

Schematic Design of essentially the same building planned for the Costa Mesa site is substantially completed and reoriented for adaption to Los Alamitos site.

Critical information required to complete design for Los Alamitos site includes soils report, topographic and site survey, acoustical considerations relative to an airport site (Los Alamitos), audio-visual information, and selection of Construction Management Consultant.

SWRL has engaged the services of Soils Consultants, Surveyor, Acoustical and Audio Visual Consultants in order to provde the Architect/Engineer with required information.

It is anticipated that a Construction Management Consultant will be engaged shortly to work with the Architect/Engineer.

Following selection of the Construction Management consultant a revised budget estimate will be prepared for the building and improvements at the Los Alamitos site.

Site and Topographic Survey

SWRL has engaged VTN, Engineers, Architects, Planners, 2301 Campus Drive, Irvine, California to make the survey and prepare a map in accordance with information required by SOM for site planning and information on location of utilities. The survey is scheduled for completion on or before October 29, 1970. Total cost -- approximately $1,300.

Building Program

The Grant makes reference to 66,400 gross square feet and 59,390 square feet of net usable space.

As we mentioned in the August 3, 1970 meeting in your Los Angeles offices, although the building is the same, the area calculations will be different because the original computations were made in a very early conceptual design stage and before the structural system was determined. The location of the glass line in our present design adds approximately 8" to each side of the building and for two floors adds almost 1,000 square feet to the gross area. Therefore, both the gross area and net usable area will be higher than the erroneous figures now stated in the Grant.

To safeguard against any misunderstanding on the area computations, our next submittal will show in bold lettering the current areas for the same building. Acknowledgement that these higher figures are understood and accepted should be made by all reviewing authorities.

Foundation Investigation and Corrosive Properties of Soils Study

SWRL has engaged LeRoy Crandall and Associates to conduct the foundation investigation and studies to determine the corrosive properties of the soils at the Los Alamitos site. The final report is scheduled for completion on or before October 29, 1970. Estimated cost - $3,850.00.

Acoustical Consultants

SWRL has engaged Goodfriend-Ostergaard Associates, consulting Engineers in acoustics, to make an acoustical survey of the site, make projections of maximum noise levels, calculate sound transmissions, and to make recommendations to provide required degree of acoustical privacy from the exterior noise sources. A preliminary verbal report to the Architect/Engineer is scheduled on October 26, 1970 with a formal report of findings and recommendations to follow. Cost of this initial acoustical work is estimated at $3,000 plus expenses. Later on it is anticipated that additional acoustical consultation will re required and the fees for the additional work will amount to approximately $4,000 plus reimbursable out-of-pocket costs.

Construction Management Consultants

Proposals were requested of Dinwiddie Construction Company, McKee-Berger-Mansueto, Robert E. McKee, Inc. and Turner Construction Company to provide construction management consultation services during the design stages and continuously through completion of construction. Representatives of SWRL (William Hein), SOM (A.A. Braccia, and John Woodbridge), FECA (Jerry Kosro and Robert Coddington) interviewed Tony Mansueto and Frank Elias of McKee-Berger-Mansueto and Gene Von Wenning and Jack Quinn of Turner Construction Company relative to their proposals on October 9, 1970. Following the interviews it was determined that Turner Construction Company was best suited to provide the construction management services for this project and that SWRL should enter into an "agency" type of agreement with Turner Construction Company as proposed in Turner's letter of September 30, 1970. Pending execution of a mutually satisfactory agreement between SWRL and Turner Construction Company, SWRL is issuing a letter of intent which will authorize Turner to provide the various preliminary consulting services referred to in their September 30, 1970 proposal.

Audio-Visual Consultants

SWRL has engaged [illegible] California Systems, Inc., (ACSI) to develop necessary information for SOM relating to program requirements in the area of instructional materials and media support. Information on specialized spaces will be obtained through interviews with SWRL personnel from which the program specifications will be developed as needed by the designer to configure the required spaces. The consultant will also develop the unique characteristics and engineering requirements for each of the specialized areas. The initial services, ACSI's consultation, will amount to approximately $4,400. If additional consultation is required later on, the extra costs will amount to approximately $1,750. It appears that the maximum amount which would be required for these services would amount to between $6,000 and $7,000.

Architect-Engineer Services

Pending execution of a mutually satisfactory agreement, SWRL has authorized SOM to continue providing consulting services as agreed to earlier on the basis of technical labor, plus labor burden, plus 150 per cent, plus out-of-pocket reimbursable costs. SWRL has also engaged all necessary consultants required to provide the Architect/Engineer with information relative to design considerations. Total SOM billings from May 1 through September 30, 1970 amount to $25,233.48. SOM has advised that SWRL will receive billings monthly.

Application for Approval of Plans and Specifications - Office of Architecture and Construction (OAC), State of California

SOM has prepared for SWRL a draft of the application required by OAC for the review and approval of the final drawings, specifications, and calculations. Their fee is 1/2 per cent of the estimated construction cost of the project and is due at the time the application is filed with the drawings, specifications, and calculations. The fee is adjusted after the final construction cost is determined upon completion of the building. Assuming for budget purposes a $3,000,000 construction cost -- the fee would amount to $15,000.

We have learned from OAC that it will take a minimum of two months, based on approximately one man/month of time per million dollars construction value, to review the plans and specifications. In the interim we can take bids but construction cannot be started until the application is stamped approved.

We have not determined why it takes so long for the OAC review. Since their time is worth several hundred thousand dollars to SWRL there must be a faster way. We will work with SWRL in checking on this.

Attachment 26. Contract with Construction Manager

THIS AGREEMENT, made this 5th day of May, 1971, by and between the SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT (hereinafter referred to as "LABORATORY"), a duly organized and validly existing public agency organized and operating under the Joint Exercise of Powers Act of the State of California, having its principal place of business at 11300 La Cienega Boulevard, Inglewood, California 90304.

and

TURNER CONSTRUCTION COMPANY (hereinafter referred to as "TURNER"), a duly organized and validly existing corporation in good standing under the laws of the State of New York, having a place of business at 150 East 42nd Street, New York, New York 10017.

WITNESSETH

WHEREAS, the LABORATORY intends to erect a 2-story laboratory/office type building approximately 90,000 sq. ft. together with appurtenant site facilities on the property of Los Alamitos Naval Air Station, located in the City of Los Alamitos, State of California (hereinafter called the "Work"), in accordance with Drawings and Specifications to be prepared by Skidmore, Owings & Merrill Architects/Engineers, One Maritime Plaza, San Francisco, California (hereinafter designated as Architect).

THAT, WHEREAS, TURNER will perform its services in cooperation with Skidmore, Owings & Merrill, whom the LABORATORY has engaged as the Architect on the project, and that TURNER has reviewed the contract between the Architect and the LABORATORY and will coordinate its services with those of the Architect as may be required therein.

THAT, WHEREAS, under Federal Grant OEG-0-70-5079, hereinafter referred to as the "Grant", $4,286,000 in total funds have been provided for the project.

AND, WHEREAS, TURNER has signified his willingness to perform all professional services, more specifically described as follows, necessary for completion of the Project in accordance with applicable Public Laws, Ordinances, and Regulations:

NOW, THEREFORE, TURNER and the LABORATORY, for the consideration hereinafter named, agree as follows:

ARTICLE 1 - Services

A. Acting as agent for and on behalf of the LABORATORY, TURNER agrees to provide the following construction management services for the coordination of the Work.

(a) Make investigations and consult with the Architect regarding the availability, suitability and cost of materials and equipment.

(b) Prepare estimates of the cost of alternate designs for the various elements of the project, as requested by the Architect or the LABORATORY, and review drawings and specifications from the standpoint of cost-effectiveness in the construction of the project.

(c) Upon completion of the Architect's schematic drawings prepare an estimate of the construction cost, and, after the completion of the working drawings and specifications, prepare an estimate of the cost of the project together with a detailed schedule for construction of the project for the Architect.

(d) Subject to the approval of the LABORATORY, TURNER shall prepare appropriate bid and contract documents and shall solicit and receive competitive proposals from contractors and material vendors for the various portions of the Work; analyze such proposals, consult with Architect and make recommendations for award by the LABORATORY and prepare contract documents for execution by the approved contractor and vendors and the LABORATORY. It is understood that no contract may be awarded until bids have been received on all portions of the Work.

TURNER shall also coordinate the necessary exchange of plan information, shop drawings and change orders, and shall review shop drawings and samples in accordance with the General Conditions of the Construction Contracts.

(e) Prepare budget reports and other reports as required for the Work and/or desired by the LABORATORY.

(f) Supervise the accounting for the Project in a form approved by the LABORATORY.

(g) Receive, check and approve, in conjunction with Architect, all invoices and requisitions for payment by the LABORATORY to contractors and material vendors.

(h) Recommend and supervise an insurance program for the Project.

(i) Provide field supervision in connection with the performance of the various contracts to see that all parts of the Work are performed and completed in accordance with Architect's plans and specifications and with the other contract documents. This shall include the establishment of procedures for the coordination of drawings for each segment of the Work before interferences are encountered; the obtaining of missing information and clarifications; the scheduling of lead time for the various trades; the expediting of critical items; the conducting of job meetings to establish status and accountability for necessary timely action for each item of work; and the reporting of field progress and otherwise perform the typical function of a General Contractor in supervising, coordinating and scheduling the work of subcontractors.

(j) Make periodic inspections as well as a final inspection of the constructed facility to determine along with the Architect, that all work conforms with the Architect's plans and specifications.

Generally, TURNER shall do all things necessary to arrange for the performance of the Work in the most expeditious and economical manner consistent with good workmanship, sound business practice and the best interests of the LABORATORY.

B. It is agreed by both parties that TURNER'S services are limited to those of construction management and TURNER will not bid for, accept a contract for, or undertake any of the actual field construction work.

TURNER will not commit the LABORATORY to any contract or amendment thereof or change order thereto without written approval of the LABORATORY, except that TURNER may make incidental discretionary purchases and commitments necessary for the execution of the Work, for and on behalf of the LABORATORY in the maximum amount of $2,000 per item without such approval. No combination of commitments shall exceed $25,000 without such approval. Receipts for each purchase setting forth dollar amounts and description of item or service received shall be periodically provided to the LABORATORY.

Article 2 - Fee

The LABORATORY shall pay TURNER under the Agreement a fee (corporate overhead and profit) of $108,000. This fee is equal to 3½ per cent of the final construction cost estimate submitted on March 19, 1971. In the event that the final construction cost as shown by the sum total of the cost of all work performed on the project including the net sum of all approved changes is 10 per cent more or less than the final construction cost estimate, TURNER'S fee shall be increased or decreased accordingly at the rate of 3½ per cent of the cost in excess of 10 per cent.

Article 3 - Reimbursable Costs

A. In addition to the fee, the LABORATORY shall reimburse TURNER for expenses incurred in performing the services under Article 1 (other tha[illegible]scretionary purchases and commitments referred to in Article 1B). The cost of these services shall not exceed $103,500 without written approval of the LABORATORY. In the event written approval is withheld, Turner shall have no obligation to continue to provide these services.

B. These reimbursable expenses shall be limited to:

1. The direct cost to TURNER in salaries and fringe benefits for services of employees assigned to the Project to perform the services set forth in Article 1. When these services are rendered by staff stationed in the home or branch offices, an additional allowance of 50 per cent of the cost of these services shall be charged to cover secretarial and office overhead expenses and;
2. Out-of-pocket expenses incurred by TURNER in performance of the Work, such as long distance phone calls charged to TURNER'S home or branch offices, travel expenses as authorized in advance by the LABORATORY, and other miscellaneous purchases of small items billed to TURNER, etc.

C. It is understood and agreed by both parties that the reimbursable costs chargeable to this Agreement includes costs incurred from the date of the letter from the LABORATORY to TURNER authorizing commencement of their services.

Article 4 - Payments

A. The LABORATORY shall pay TURNER on a monthly basis 3½ per cent of the net cost of the Work to the LABORATORY for the corresponding month. The final fee payment, which shall be the difference between the sum of all fee payments to date and the fixed fee, shall be due and payable 30 days after approval and acceptance of the Project by the Architect.

B. In addition, the LABORATORY will pay TURNER monthly for all reimbursable expenses described in Article 3B.

Article 5 - Arbitration

Any controversy arising out of or relating to this Agreement or the breach thereof shall be settled by arbitration in accordance with the rules then obtaining of the American Arbitration Association and judgment upon the award may be entered in any court having jurisdiction thereof.

Article 6 - Termination

The LABORATORY shall have the right to terminate this Agreement at any time by giving 10 days written notice of such termination to TURNER. If the LABORATORY shall terminate this Agreement, the LABORATORY shall reimburse TURNER for all expenses incurred up to the date of such termination as provided for in Article 3 hereof, which TURNER has earned to the date of such termination plus 3½ per cent of any retentions against the actual cost of the Work performed.

In the event this Agreement is terminated prior to the commencement of Work in the field, the LABORATORY shall reimburse TURNER for all authorized out-of-pocket reimbursable expenses incurred up to the date of termination plus all salaries and fringe benefits of technical personnel charged to the Project plus 150 per cent of such technical salaries and fringe benefits.

This Agreement shall not be assignable by TURNER without the written consent of the LABORATORY.

TURNER and the LABORATORY for themselves, their successors, executors, administrators and assigns hereby agree to the full performance of the covenants herein contained.

Article 7 - Equal Opportunity

The Equal Opportunity Clause described in paragraph 3.09, Option B, of HEW Grant #OEG-0-70-5079 is hereby incorporated herein as a part of this Agreement.

Article 8 - Examination of Records

TURNER agrees that the Government or any duly authorized representatives, shall, until the expiration of five years after final payment under this Agreement, have access to and the right to examine any directly pertinent books, documents, papers and records of TURNER, involving transactions related to the Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their proper officers hereunto duly authorized, and have caused their corporate seal to be affixed hereto on the day and year first above written.

SOUTHWEST REGIONAL LABORATORY FOR
EDUCATIONAL RESEARCH & DEVELOPMENT

By ______________________
[illegible]

Attest:

____

TURNER CONSTRUCTION COMPANY

By ______________________
Vice President
5/10/71

Attest:

____
[illegible] 5/10/71

Attachment 27. Advertisement for Construction Bids

Anaheim Bulletin

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA,
County of Orange, } ss.

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the **Anaheim Bulletin,** a newspaper of general circulation, printed and published in the City of Anaheim, County of Orange, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of December 28, 1951, Case Number A-21021, that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

April 14,21,1971

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Executed at Anaheim, California.

Date April 21, 19 71

Cecil E. Martin
Signature

PROOF OF

[illegible] supersedes the one previously [illegible]

SUB-BIDS REQUESTED— [illegible]
SOUTHWEST REGIONAL LABORATORY
For Educational Research and Development
[illegible]
[illegible]

[illegible] square feet, 2 story, Steel Frame
Office [illegible] Laboratory Building

TURNER CONSTRUCTION COMPANY

Construction Manager [illegible]
Out for Bids

BIDS WILL BE RECEIVED FROM
PREQUALIFIED SUBCONTRACTORS ONLY

Contact: Ralph Turner
415 So. Figueroa, Los Angeles —
Telephone 213 [illegible]

[illegible] to be delivered [illegible] sealed envelopes [illegible]
[illegible] South Figueroa Street
Los Angeles, California 90017
Attention: Mr. [illegible]

The [illegible] "BID — SOUTHWEST REGIONAL LABORATORY" [illegible]

MONDAY, APRIL 26, [illegible] P.M.
[illegible]
1. [illegible] for Drainage [illegible]
2. [illegible]
3. [illegible] Hardware
4. [illegible] Partitions
5. [illegible] Accessories
6. [illegible] Floors
7. [illegible] Floor System
8. [illegible] Paving
MONDAY, APRIL 26, [illegible] P.M.
[illegible]
9. [illegible] Waterproofing
10. Sheet Metal
11. [illegible] Metal Work
12. [illegible] Partitions
13. [illegible]
14. [illegible]
15. [illegible] Bumpers
16. [illegible] Screens
17. [illegible] Boards
18. [illegible]
19. [illegible] Striping
20. Landscaping
MONDAY, APRIL 26, 4:00 P.M.
[illegible]
21. Carpentry [illegible] acoustic board and [illegible] wall covering)
22. Ceramic Tile
23. [illegible]
24. Wall Covering

[illegible]
[illegible] Floors
[illegible]
[illegible]
30. [illegible] Fence
TUESDAY, APRIL [illegible] P.M.
[illegible]
[illegible]
42. Fire [illegible]
[illegible]
TUESDAY, APRIL [illegible] P.M.
[illegible]
46. Structural Steel
47. [illegible]
48. [illegible]
49. [illegible]
50. [illegible]

[illegible] to the Labor Code of the State of California [illegible] which will be awarded [illegible]

	Basic Hourly Rates	H & W	Pen
ASBESTOS WORKERS	$8.77	[illegible]	[illegible]
BOILERMAKERS	7.27	.20	[illegible]
[illegible] HELPERS	6.50	.20	[illegible]
BRICKLAYERS, Stonemasons	6.45	.25	[illegible]
BRICK TENDERS	5.20	.25	.64
CARPENTERS:			
Carpenters	5.98	.51	.55
Saw Filers	6.05	.51	[illegible]
Table power saw operator	6.08	.51	[illegible]
Shinglers	6.11	.51	[illegible]
Hardwood floor layers; Millwrights	6.18	.51	[illegible]
[illegible] nailer	6.23	.51	[illegible]
Piledrivermen:			
[illegible] Slingers	6.05	.51	[illegible]
[illegible] carpenters; derrick bargemen	6.11	.51	[illegible]
[illegible] Rock Slingers	6.21	.51	[illegible]
CEMENT MASONS			
Cement Masons	5.48	.20	[illegible]
Cement Floating & Troweling machine operator	5.73	.20	[illegible]
DRYWALL INSTALLER	7.25	.45	.55
ELECTRICIANS:			
[illegible]	8.15	.25	[illegible]
Cable splicers	8.52	.25	[illegible]
ELEVATOR CONSTRUCTORS	7.38	.17	[illegible]
ELEVATOR CONSTRUCTORS HELPERS	70 [illegible]	.17	[illegible]
ELEVATOR CONSTRUCTORS HELPERS (PROB.)	50 [illegible] JR		
GLAZIERS	7.03	.20	[illegible]
IRONWORKERS:			
Reinforcing	7.20	.38	[illegible]
Fence Erectors	7.21	[illegible]	[illegible]
[illegible] Ornamental	[illegible]	[illegible]	[illegible]
[illegible] & LAWN SPRINKLERS	[illegible]	[illegible]	[illegible]
LATHERS	5.63	.19	[illegible]
LINE CONSTRUCTION:			
[illegible], 1st year	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible] equipment operators	[illegible]	[illegible]	[illegible]

Attachment 28. Approval for Award of Contract by Construction Manager

File

Turner Construction Company

FOUNDED 1902

445 SOUTH FIGUEROA STREET, LOS ANGELES, CALIFORNIA 90017

TELEPHONE: 213-683-1430

June 29, 1971

Re: Southwest Regional Laboratory
Our Job No. 2790-M

APPROVAL LETTER NO. 24
Roofing

Mr.R. L. Christensen
Southwest Regional Laboratory
61551 West Century Boulevard
Suite 220
Los Angeles, California 90045

Gentlemen:

We request your formal approval to award a Contract for the Roofing Work, Sections 7.1A; 7.4B and 7.4F in accordance with Exhibit A list of Construction Documents dated 5/3/71 to:

Coast Roofing
P. O. Box 66
3574 E. Cerritos
Los Alamitos, California

for the amount of SEVENTEEN THOUSAND NINE HUNDRED NINETY SIX AND NO/100 DOLLARS ($17,996.00).

A Certified Bid Tabulation list is attached.

Please indicate your approval to the award of this Contract by signing in the space provided below and return one signed copy to us.

Very truly yours,

Ralph P. Torrer
Project Manager
RPT:ls
Enclosures
cc: Messrs. A. A. Braccia
R. R. Peterman
H. C. Ball
P. D. Brewer
J. C. Celler
R. W. Malone

APPROVED:
SOUTHWEST REGIONAL LABORATORY

By ______________ Date 7/1/71

SWRL #2790-M June 29, 1971

Turner Construction Company

Tabulation of Roof, Insulation, Waterproofing

Contractors	Amount
Coast Roof Co.	$ 17,996.00
Owen Roofing	18,164.00
Federal Roof	18,375.00
Associated Roof Co.	22,467.00

CERTIFIED BID TABULATION

By

Ralph P. Turner
Turner Construction Company

Date 6-29-71

Attachment 29. Contract with Construction Contractor

COAST ROOF CO.
AGREEMENT NO. 2790-M-24
OWNER'S ITEM NO. 610-9

CONTRACTOR'S AGREEMENT

Southwest Regional Laboratory For
Educational Research and Development
Los Alamitos, California

Turner Construction Company is serving the Southwest Regional Laboratory for Educational Research and Development, owner of the project, under a "Construction Management" agreement.

Wherever in this Agreement the words "Turner Construction Company" and/or the word "Turner" may appear, it shall be read and understood to mean "Owner and/or Turner Construction Company, as agent for and on behalf of the Owner." Further, wherever in this Agreement, the word "Subcontractor" may appear, it shall be read and understood to mean"Contractor."

Wherever in this Agreement the words "General Contract" may appear, it shall be read and understood to mean "Management Contract".

APPROVED

ORIGINAL

FORM 38 (11-66)
SWRL

AGREEMENT NO.
2790-M-24

APPROVAL LETTER
NO. A-24

This Agreement, made the thirtieth day of June in the year one thousand nine hundred and seventy-one by and between TURNER CONSTRUCTION COMPANY, (hereinafter called TURNER) and COAST ROOF CO., with offices located at 3574 East Cerritos Street (P. O. Box 66), Los Alamitos, California 90720. (Telephone: SP 5-1705) (hereinafter called the Subcontractor).

Witnesseth, that the Subcontractor and Turner agree as follows:

Description of Work

ARTICLE I. The Subcontractor shall perform and furnish all the work, labor, services, materials, plant, equipment, tools, scaffolds, appliances and all other things necessary for the furnishing and installation of all Built-up Bituminous Roof System, Membrane Waterproofing and Metallic Waterproofing in accordance with the Drawings and Specifications and as more particularly described in Sections 7.1A, 7.4B and 7.4F of the Specifications and in the Additional Provisions to this Agreement. Amendments (page 8) and Exhibits "A" and "B" are attached hereto and a part hereof.

(hereinafter called the Work) for and at the Southwest Regional Laboratory for Educational Research & Development (hereinafter called the Project), located on premises at 4665 Lampson Ave., Los Alamitos, Calif. (hereinafter called the Premises), as shown and described in and in strict accordance with the Plans, Specifications, General Conditions, Special Conditions and Addenda thereto prepared by Skidmore, Owings & Merrill (hereinafter called the Architect) and with the terms and provisions of the General Contract (hereinafter called the General Contract) between Turner and Southwest Regional Laboratory for Educational Research & Development (hereinafter called the Owner) dated May 5, 1971 and in strict accordance with the Additional Provisions, page(s) 8A- - - - - - - - - - annexed hereto and made a part hereof.

Contract Documents

ARTICLE II. The Plans, Specifications, General Conditions, Special Conditions, Addenda and General Contract, [illegible] for examination by the Subcontractor at all reasonable times at the office of Turner; all of the aforesaid, including this Agreement, being hereinafter sometimes referred to as the Contract Documents. The Subcontractor represents and agrees that it has carefully examined and understands this Agreement and the other Contract Documents, has investigated the nature, locality and site of the Work and the conditions and difficulties under which it is to be performed, and that it enters into this Agreement on the basis of its own examination, investigation and evaluation of all such matters and not in reliance upon any opinions or representations of Turner, the Architect, or of the Owner, or of any of their respective officers, agents, servants, or employees.

With respect to the Work to be performed and furnished by the Subcontractor hereunder the Subcontractor agrees to be bound to the Owner and agrees to bind each of his Subcontractors performing all or any portion of the Work to all the terms and provisions of the Contract Documents.

The terms and provisions of this Agreement with respect to the Work to be performed and furnished by the Subcontractor hereunder are intended to be and shall be in addition to and not in substitution for any of the terms and provisions of the General Contract and the other Contract Documents.

Time of Completion

ARTICLE III. The Subcontractor shall complete the several portions and the whole of the Work at or before the time or times hereinafter stated, to wit:

The Subcontractor shall carefully coordinate his Work with the job requirements and shall furnish at all times sufficient material, skilled workmen and equipment to perform the Work to the entire satisfaction of Turner so as not to delay the completion of the whole or any part of the Project.

Should the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Subcontractor or any of its officers, agents, servants or employees so as to cause any additional cost, expense, liability or damage to Turner or to the Owner or any damages or additional costs or expenses for which Turner or the Owner may or shall become liable, the Subcontractor shall and does hereby agree to compensate Turner and the Owner for and indemnify them against all such costs, expenses, damages and liability.

Turner, if it deems necessary, may direct the Subcontractor to work overtime and if so directed the Subcontractor shall work said overtime and, provided that the Subcontractor is not in default under any of the terms or provisions of this Agreement or of any of the other Contract Documents, Turner will pay the Subcontractor for such actual additional wages paid, if any, at rates which have been approved by Turner, plus taxes imposed by law on such additional wages, plus workmen's compensation insurance, liability insurance and levies on such additional wages if required to be paid by the Subcontractor.

If, however, the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Subcontractor or any of its officers, agents, servants or employees, then the Subcontractor shall, in addition to all of the other obligations imposed by this Agreement upon the Subcontractor in such case, and at its own cost and expense, work such overtime as may be necessary to make up for all time lost and to avoid delay in the completion of the Work and of the Project.

Price

ARTICLE IV. The sum to be paid by Turner to the Subcontractor for the satisfactory performance and completion of the Work and of all of the duties, obligations and responsibilities of the Subcontractor under this Agreement and the other Contract Documents shall be

SEVENTEEN THOUSAND NINE HUNDRED NINETY SIX AND NO/100 DOLLARS ($17,996.00).

(hereinafter called the Price) subject to additions and deductions as herein provided.

The Price includes all Federal, State, County, Municipal and other taxes imposed by law and based upon labor, services, materials, equipment or other items acquired, performed, furnished or used for or in connection with the Work, including but not limited to sales, use and personal property taxes payable by or levied or assessed against the Owner, Turner or the Subcontractor. Where the law requires any such taxes to be stated and charged separately, the total price of all items included in the Work plus the amount of such taxes shall not exceed the Price.

Monthly Estimate

On or before the last day of each month the Subcontractor shall submit to Turner, in the form required by Turner, a written requisition for payment showing the proportionate value of the Work installed to that date, from which shall be deducted: a reserve of ten per cent (10%); all previous payments; and all charges for services, materials, equipment and other items furnished by Turner to or chargeable to the Subcontractor; and the balance of the amount of such requisition, as approved by Turner and the Architect and for which payment has been received by Turner from the Owner, shall be due and paid to the Subcontractor on or about the fifteenth (15th) day of the succeeding month.

The Subcontractor shall submit with its first requisition for payment a detailed schedule showing the breakdown of the Price into its various parts for use only as a basis of checking the Subcontractor's monthly requisitions.

Turner reserves the right to advance the date of any payment (including the final payment) under this Agreement if, in its sole judgment, it becomes desirable to do so.

The Subcontractor agrees that, if and when requested so to do by Turner, it shall furnish such information, evidence and substantiation as Turner may require with respect to the nature and extent of all obligations incurred by the Subcontractor for or in connection with the Work, all payments made by the Subcontractor thereon, and the amounts remaining unpaid, to whom and the reasons therefor.

Final Payment

The final payment shall be due within forty (40) days after completion and acceptance of the Work by Turner and the Architect, provided first, however, that (1) Turner shall have received final payment therefor from the Owner, (2) the Subcontractor shall have furnished evidence satisfactory to Turner that there are no claims, obligations or liens outstanding or unsatisfied for labor, services, materials, equipment, taxes or other items performed, furnished or incurred for or in connection with the Work and (3) the Subcontractor shall have executed and delivered in a form satisfactory to Turner a General Release running to and in favor of Turner and the Owner. Should there prove to be any such claim, obligation or lien after final payment is made, the Subcontractor shall refund to Turner all monies that Turner and/or the Owner shall pay in satisfying, discharging or defending against any such claim, obligation or lien or any action brought or judgment recovered thereon and all costs and expenses, including legal fees and disbursements, incurred in connection therewith.

Payments Withheld

If any claim or lien is made or filed with or against Turner, the Owner, the Project or the Premises by any person claiming that the Subcontractor or any subcontractor or other person under it has failed to make payment for any labor, services, materials, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work, or if at any time there shall be evidence of such nonpayment or of any claim or lien for which, if established, Turner or the Owner might become liable and which is chargeable to the Subcontractor, or if the Subcontractor or any subcontractor or other person under it causes damage to the Work or to any other work on the Project, or if the Subcontractor fails to perform or is otherwise in default under any of the terms or provisions of this Agreement, Turner shall have the right to retain from any payment then due or thereafter to become due an amount which it deems sufficient to (1) satisfy, discharge and/or defend against any such claim or lien or any action which may be brought or judgment which may be recovered thereon, (2) make good any such nonpayment, damage, failure or default, and (3) compensate Turner and the Owner for and indemnify them against any and all losses, liability, damages, costs and expenses, including legal fees and disbursements, which may be sustained or incurred by either or both of them in connection therewith. Turner shall have the right to apply and charge against the Subcontractor so much of the amount retained as may be required for the foregoing purposes.

If the amount retained is insufficient therefor, the Subcontractor shall be liable for the difference and pay the same to Turner.

Payments etc., non Acceptance

No payment (final or otherwise) made under or in connection with this Agreement shall be conclusive evidence of the performance of the Work or of this Agreement, in whole or in part, and no such payment shall be construed to be an acceptance of defective, faulty or improper work or materials nor shall it release the Subcontractor from any of its obligations under this Agreement, nor shall entrance and use by the Owner constitute acceptance of the Work or any part thereof.

Extension of Time

ARTICLE V. Should the Subcontractor be delayed in the commencement, prosecution or completion of the Work by the act, omission, neglect or default of Turner or of anyone employed by Turner, or of any other contractor or subcontractor on the Project, or by any damage caused by fire or other casualty or by the combined action of workmen in no wise chargeable to the Subcontractor, or by any extraordinary conditions arising out of war or government regulations, or by any other cause beyond the Subcontractor's control and not due to any fault, neglect, act or omission on its part, then the Subcontractor shall be entitled to an extension of time only, such extension to be for a period equivalent to the time lost by reason of any and all of the aforesaid causes, as determined by Turner. In the event of dispute by the Subcontractor, the matter shall be referred to the Architect whose decision thereon shall be final and binding upon the parties hereto. The Subcontractor shall not be entitled to any such extension of time, however, unless a claim therefor is presented in writing to Turner within forty-eight (48) hours of the commencement of such claimed delay. Such extension or extensions of time, as determined by Turner or by the Architect, or the decision or decisions of the Architect that no extension of time shall be allowed, shall release and discharge Turner of and from any and all claims of whatever character by the Subcontractor on account of the aforesaid or any other causes of delay.

Freight Charges and Shipments

ARTICLE VI. The Subcontractor in making or ordering shipments shall not consign or have consigned materials, equipment or any other items in the name of Turner. Turner is under no obligation to make payment for charges on shipments made by or to the Subcontractor but may, at its option, pay such charges, in which case the Subcontractor shall reimburse Turner for the amount of such payments plus a service charge of twenty-five per cent (25%) of the amount so paid.

Dimensions

ARTICLE VII. Notwithstanding the dimensions given on the Plans, Specifications and other Contract Documents it shall be the obligation and responsibility of the Subcontractor to take such measurements as will insure the proper matching and fitting of the Work covered by this Agreement with contiguous work.

Shop Drawings

The Subcontractor shall prepare and submit to Turner such shop drawings as may be necessary to describe completely the details and construction of the Work. Approval of such shop drawings by Turner and/or the Architect shall not relieve the Subcontractor of its obligation to perform the Work in strict accordance with the Plans, Specifications, the Additional Provisions hereof and the other Contract Documents, nor of its responsibility for the proper matching and fitting of the Work with contiguous work.

Contiguous Work

Should the proper and accurate performance of the Work hereunder depend upon the proper and accurate performance of other work not covered by this Agreement, the Subcontractor shall carefully examine such other work, determine whether it is in fit, ready and suitable condition for the proper and accurate performance of the Work hereunder, use all means necessary to discover any defects in such other work, and before proceeding with the Work hereunder, report promptly any such improper conditions and defects to Turner, in writing and allow Turner a reasonable time to have such improper conditions and defects remedied.

Interpretation of Plans and Specifications

ARTICLE VIII. The Work hereunder is to be performed and furnished under the direction and to the satisfaction of both the Architect and Turner. The decision of the Architect as to the true construction, meaning and intent of the Plans and Specifications shall be final and binding upon the parties hereto. Turner will furnish to the Subcontractor such additional information and Plans as may be prepared by the Architect to further describe the Work to be performed and furnished by the Subcontractor and the Subcontractor shall conform to and abide by the same.

The Subcontractor shall not make any changes, additions and/or omissions in the Work except upon written order of Turner as provided in Article IX hereof.

Change Orders, Additions and Deductions

ARTICLE IX. Turner reserves the right, from time to time, whether the Work or any part thereof shall or shall not have been completed, to make changes, additions and/or omissions in the Work as it may deem necessary, upon written order to the Subcontractor. The value of the work to be changed, added or omitted shall be stated in said written order and shall be added to or deducted from the Price.

The value of the work to be changed, added or omitted shall be determined by the lump sum or unit prices, if any, stipulated herein for such work. If no such prices are stipulated, such value shall be determined by whichever of the following methods or combination thereof Turner may elect:

(a) By adding or deducting a lump sum or an amount determined by a unit price agreed upon between the parties hereto.

(b) By adding (1) the actual net cost to the Subcontractor of labor in accordance with the established rates, including required union benefits, premiums the Subcontractor is required to pay for workmen's compensation and liability insurance, and payroll taxes on such labor, (2) the actual cost to the Subcontractor of materials and equipment and such other direct costs as may be approved by Turner, less all savings, discounts, rebates and credits, (3) an allowance of 10% for overhead on items (1) and (2) above, and (4) an allowance of 5% for profit on items (1), (2) and (3) above.

Should the parties hereto be unable to agree as to the value of the work to be changed, added or omitted, the Subcontractor shall proceed with the work promptly under the written order of Turner from which order the stated value of the work shall be omitted, and the determination of the value of the work shall be referred to the Architect whose decision shall be final and binding upon the parties hereto.

In the case of omitted work Turner shall have the right to withhold from payments due or to become due to the Subcontractor an amount which, in Turner's opinion, is equal to the value of such work until such time as the value thereof is determined by agreement or by the Architect as hereinabove provided.

All changes, additions or omissions in the Work ordered in writing by Turner shall be deemed to be a part of the Work hereunder and shall be performed and furnished in strict accordance with all of the terms and provisions of this Agreement and the other Contract Documents.

Inspection and Defective Work

(See amendment page 8.)
INITIALED

ARTICLE X. The Subcontractor shall at all times provide sufficient, safe and proper facilities for the inspection of the Work by Turner, the Architect and their authorized representatives in the field, at shops, or at any other place where materials or equipment for the Work are in the course of preparation, manufacture, treatment or storage. The Subcontractor shall, within twenty-four (24) hours after receiving written notice from Turner to that effect, proceed to take down all portions of the Work and remove from the premises all materials whether worked or unworked, which the Architect or Turner shall condemn as unsound, defective or improper or as in any way failing to conform to this Agreement or the Plans, Specifications or other Contract Documents, and the Subcontractor, at its own cost and expense, shall replace the same with proper and satisfactory work and materials and make good all work damaged or destroyed by or as a result of such unsound, defective, improper or nonconforming work or materials or by the taking down, removal or replacement thereof.

Failure to Prosecute, etc.

ARTICLE XI. Should the Subcontractor at any time refuse or neglect to supply a sufficiency of skilled workmen or materials of the proper quality and quantity, or fail in any respect to prosecute the Work with promptness and diligence, or cause by any act or omission the stoppage or delay of or interference with or damage to the work of Turner or of any other contractors or subcontractors on the Project, or fail in the performance of any of the terms and provisions of this Agreement or of the other Contract Documents, or should the Architect determine that the Work or any portion thereof is not being performed in accordance with the Contract Documents, or should there be filed by or against the Subcontractor a petition in bankruptcy or for an arrangement or reorganization, or should the Subcontractor become insolvent or be adjudicated a bankrupt or go into liquidation or dissolution, either voluntarily or involuntarily or under a court order, or make a general assignment for the benefit of creditors, or otherwise acknowledge insolvency, then in any of such events, each of which shall constitute a default hereunder on the Subcontractor's part, Turner shall have the right, in addition to any other rights and remedies provided by this Agreement and the other Contract Documents or by law, after three (3) days written notice to the Subcontractor mailed or delivered to the last known address of the latter, (a) to perform and furnish through itself or through others any such labor or materials for the Work and to deduct the cost thereof from any monies due or to become due to the Subcontractor under this Agreement, and/or (b) to terminate the employment of the Subcontractor for all or any portion of the Work, enter upon the premises and take possession, for the purpose of completing the Work, of all materials, equipment, scaffolds, tools, appliances and other items thereon, all of which the Subcontractor hereby transfers, assigns and sets over to Turner for such purpose, and to employ any person or persons to complete the Work and provide all the labor, services, materials, equipment and other items required therefor. In case of such termination of the employment of the Subcontractor, the Subcontractor shall not be entitled to receive any further payment under this Agreement until the Work shall be wholly completed to the satisfaction of Turner and the Architect and shall have been accepted by them, at which time, if the unpaid balance of the amount to be paid under this Agreement shall exceed the cost and expense incurred by Turner in completing the Work, such excess shall be paid by Turner to the Subcontractor; but if such cost and expense shall exceed such unpaid balance, then the Subcontractor shall pay the difference to Turner. Such cost and expense shall include, not only the cost of completing the Work to the satisfaction of Turner and the Architect and of performing and furnishing all labor, services, materials, equipment, and other items required therefor, but also all losses, damages, costs and expenses, including legal fees and disbursements sustained, incurred or suffered by reason of or resulting from the Subcontractor's default.

Loss or Damage to Work

ARTICLE XII. Turner shall not be responsible for any loss or damage to the Work to be performed and furnished under this Agreement, however caused, until after final acceptance thereof by Turner and the Architect, nor shall Turner be responsible for loss of or damage to materials, tools, equipment, appliances or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Work, however caused.

Fire Insurance

Turner or the Owner shall effect and maintain fire insurance (with extended coverage, if specified or otherwise required) upon all Work, materials and equipment incorporated in the Project and all materials and equipment on or about the Premises intended for permanent use or incorporation in the Project or incident to the construction thereof, the capital value of which is included in the cost of the Work, but not including any contractors' machinery, tools, equipment, appliances or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Work.

The total value of the property described above as insurable under this Article and as shown on the approved monthly requisition provided for in Article IV, plus the total value of similar property incorporated in the Project or delivered on the Premises during the month but not included in said requisition, as reported by the Subcontractor to Turner for insurance purposes only, shall determine the total value of the Subcontractor's work, materials and equipment to be insured under this Article.

The maximum liability to the Subcontractor under this insurance shall be for not more than that proportion of any loss which the last reported value of the insured property bore to the actual value of said property at the time of such last report, and in no event for more than the actual loss.

In the event of a loss insured under this Article, the Subcontractor shall be bound by any adjustment which shall be made between Turner or the Owner and the insurance company or companies. Loss, if any, shall be made payable to Turner and/or the Owner, as their interests may appear, for the account of whom it may concern.

Cleaning Up

ARTICLE XIII. The subcontractor shall, at its own cost and expense, (1) keep the Premises free at all times from all waste materials, packaging materials and other rubbish accumulated in connection with the execution of its Work by collecting and depositing said materials and rubbish in locations or containers as designated by Turner from which it shall be removed by Turner from the Premises without charge, (2) clean and remove from its own Work and from all contiguous work of others any soiling, staining, mortar, plaster, concrete or dirt caused by t execution of its Work and make good all defects resulting therefrom, (3) at the completion of its Work in each area, perform such cleaning as may be required to leave the area "broom clean," and (4) at the entire completion of its Work, remove all of its tools, equipment, scaffolds, shanties and surplus materials. Should the Subcontractor fail to perform any of the foregoing to Turner's satisfaction, Turner shall have the right to perform and complete such work itself or through others and charge the cost thereof to the Subcontractor.

Compliance with Law and Permits
(See amendment page 8.)
INITIALED

ARTICLE XIV. The Subcontractor shall obtain and pay for all necessary permits and licenses pertaining to the Work and shall comply with all Federal, State, Municipal and local laws, ordinances, rules, regulations, orders, notices and requirements, including, among others, those relating to discrimination in employment, fair employment practices or equal employment opportunity, and with the requirements of the American Insurance Association, whether or not provided for by the Plans, Specifications, General Conditions or other Contract Documents, without additional charge or expense to Turner, and shall also be responsible for and correct, at its own cost and expense, any violations thereof resulting from or in connection with the performance of its Work. The Subcontractor shall at any time upon demand furnish such proof as Turner may require showing such compliance and the correction of such violations. The Subcontractor agrees to save harmless and indemnify Turner from and against any and all loss, injury, claims, actions, proceedings, liability, damages, fines, penalties, costs and expenses, including legal fees and disbursements, caused or occasioned directly or indirectly by the Subcontractor's failure to comply with any of said laws, ordinances, rules, regulations, orders, notices or requirements or to correct such violations.

Labor to be Employed

ARTICLE XV. The Subcontractor shall not employ men, means, materials or equipment which may cause strikes, work stoppages or any disturbances by workmen employed by the Subcontractor, Turner or other contractors or subcontractors on or in connection with the Work or the Project or the location thereof. The Subcontractor agrees that all disputes as to jurisdiction of trades shall be adjusted in accordance with any plan for the settlement of jurisdictional disputes which may be in effect either nationally or in the locality in which the Work is being done and that it shall be bound and abide by all such adjustments and settlements of jurisdictional disputes, provided that the provisions of this Article shall not be in violation of or in conflict with any provisions of law applicable to the settlement of such disputes. Should the Subcontractor fail to carry out or comply with any of the foregoing provisions, Turner shall have the right, in addition to any other rights and remedies provided by this Agreement or the other Contract Documents or by law, after three (3) days written notice mailed or delivered to the last known address of the Subcontractor, to terminate this Agreement or any part thereof or the employment of the Subcontractor for all or any portion of the Work, and, for the purpose of completing the Work, to enter upon the Premises and take possession, in the same manner, to the same extent and upon the same terms and conditions as set forth in Article XI of this Agreement.

Taxes and Contributions

ARTICLE XVI. The Subcontractor for the Price herein provided for, hereby accepts and assumes exclusive liability for and shall indemnify, protect and save harmless Turner and the Owner from and against the payment of:

1. All contributions, taxes or premiums (including interest and penalties thereon) which may be payable under the Unemployment Insurance Law of any State, the Federal Social Security Act, Federal, State, County and/or Municipal Tax Withholding Laws, or any other law, measured upon the payroll of or required to be withheld from employees, by whomsoever employed, engaged in the Work to be performed and furnished under this Agreement.
2. All sales, use, personal property and other taxes (including interest and penalties thereon) required by any Federal, State, County, Municipal or other law to be paid or collected by the Subcontractor or any of its subcontractors or vendors or any other person or persons acting for, through or under it or any of them, by reason of the performance of the Work or the acquisition, ownership, furnishing or use of any materials, equipment, supplies, labor, services or other items for or in connection with the Work.
3. All pension, welfare, vacation, annuity and other union benefit contributions payable under or in connection with labor agreements with respect to all persons, by whomsoever employed, engaged in the Work to be performed and furnished under this Agreement

Patents
(See amendment page 8.)
INITIALED

ARTICLE XVII. The Subcontractor hereby agrees to indemnify, protect and save harmless Turner and the Owner from and against any and all liability, loss or damage and to reimburse Turner and the Owner for any expenses, including legal fees and disbursements, to which Turner and the Owner may be put because of claims or litigation on account of infringement or alleged infringement of any letters patent or patent rights by reason of the Work or materials, equipment or other items used by the Subcontractor in its performance.

Mechanics' Liens or Claims

ARTICLE XVIII. The Subcontractor for itself and for its subcontractors, laborers and materialmen and all others directly or indirectly acting for, through or under it or any of them covenants and agrees that no mechanics' liens or claims will be filed or maintained against the Project or Premises or any part thereof or any interests therein or any improvements thereon, or against any monies due or to become due from the Owner to Turner or from Turner to the Subcontractor, for or on account of any work, labor, services, materials, equipment or other items performed or furnished for or in connection with the Work, and the Subcontractor for itself and its subcontractors, laborers and materialmen and all others above mentioned does hereby expressly waive, release and relinquish all rights to file or maintain such liens and claims and agrees further that this waiver of the right to file or maintain mechanics' liens and claims shall be an independent covenant and shall apply as well to work, labor and services performed and materials, equipment and other items furnished under any change order or supplemental agreement for extra or additional work in connection with the Project as to the original Work covered by this Agreement.

If any subcontractor, laborer or materialman of the Subcontractor or any other person directly or indirectly acting for, through or under it or any of them files or maintains a mechanic's lien or claim against the Project or Premises or any part thereof or any interests therein or any improvements thereon or against any monies due or to become due from the Owner to Turner or from Turner to the Subcontractor, for or on account of any work, labor, services, materials, equipment or other items performed or furnished for or in connection with the Work or under any change order or supplemental agreement for extra or additional work in connection with the Project, the Subcontractor agrees to cause such liens and claims to be satisfied, removed or discharged at its own expense by bond, payment or otherwise within ten (10) days from the date of the filing thereof, and upon its failure so to do Turner shall have the right, in addition to all other rights and remedies provided under this Agreement and the other Contract Documents or by law, to cause such liens or claims to be satisfied, removed or discharged by whatever means Turner chooses, at the entire cost and expense of the Subcontractor (such cost and expense to include legal fees and disbursements). The Subcontractor agrees to indemnify, protect and save harmless Turner and the Owner from and against any and all such liens and claims and actions brought or judgments rendered thereon, and from and against any and all loss, damages, liability, costs and expenses, including legal fees and disbursements, which Turner and/or the Owner may sustain or incur in connection therewith.

Assignment and Subletting

ARTICLE XIX. Neither this Agreement nor any monies due or to become due hereunder shall be assignable without the prior written consent of Turner nor shall the whole or any part of this Agreement be sublet without like prior written consent. Any such assignment or subletting without such prior written consent shall be void and of no effect and shall vest no right or right of action in the assignee or subcontractor against Turner. Turner's consent to any assignment or subletting shall not relieve the Subcontractor of any of its agreements, duties, responsibilities or obligations under this Agreement and the other Contract Documents, and the Subcontractor shall be and remain as fully responsible and liable for the defaults, neglects, acts and omissions of its assignees and subcontractors and all persons directly or indirectly employed by them as it is for its own defaults, neglects, acts and omissions and those of its own officers, agents, servants and employees. The Subcontractor shall bind each of its subcontractors to all of the terms, provisions and covenants of this Agreement and the other Contract Documents with respect to the sublet Work. Turner's consent to any subletting shall not be deemed to create any contractual relationship between Turner and any subcontractor to whom the Work or any portion thereof is sublet, and shall not vest any right or right of action in such subcontractor against Turner.

Termination of Agreement

ARTICLE XX. Turner shall have the right at any time by written notice to the Subcontractor, to terminate this Agreement and require the Subcontractor to cease work hereunder, in which case, provided the Subcontractor be not then in default, Turner shall indemnify the Subcontractor against any damage directly resulting from such termination, except that the Subcontractor shall not be entitled to anticipated profits on work unperformed or on materials or equipment unfurnished.

Guarantees
(See amendment
page 8.)
INITIALED

ARTICLE XXI. The Subcontractor hereby guarantees the Work to the full extent provided in the Plans, Specifications, General Conditions, Special Conditions and other Contract Documents.

The Subcontractor shall remove, replace and/or repair at its own expense and at the convenience of the Owner any faulty, defective or improper work, materials or equipment discovered within one (1) year from the date of the acceptance of the Project as a whole by the Architect and the Owner or for such longer period as may be provided in the Plans, Specifications, General Conditions, Special Conditions or other Contract Documents.

Without limitation by the foregoing, the Subcontractor shall pay in addition for all damage to the Project resulting from defects in the Work and all costs and expenses necessary to correct, remove, replace and/or repair the Work and any other work or property which may be damaged in correcting, removing, replacing or repairing the Work.

Accident Prevention

ARTICLE XXII. The Subcontractor agrees that the prevention of accidents to workmen engaged upon or in the vicinity of the Work is its responsibility. The Subcontractor agrees to comply with all laws, ordinances, rules, regulations, codes, orders, notices and requirements concerning safety as shall be applicable to the Work and with the safety standards established during the progress of the Work by Turner. When so ordered, the Subcontractor shall stop any part of the Work which Turner deems unsafe until corrective measures satisfactory to Turner have been taken, and the Subcontractor agrees that it shall not have nor make any claim for damages growing out of such stoppages. Should the Subcontractor neglect to take such corrective measures, Turner may do so at the cost and expense of the Subcontractor and may deduct the cost thereof from any payments due or to become due to the Subcontractor. Failure on the part of Turner to stop unsafe practices shall in no way relieve the Subcontractor of its responsibility therefor.

Liability for Damage and Personal Injury

ARTICLE XXIII. The Subcontractor hereby assumes entire responsibility and liability for any and all damage or injury of any kind or nature whatever (including death resulting therefrom) to all persons, whether employees of the Subcontractor or otherwise, and to all property caused by, resulting from, arising out of or occurring in connection with the execution of the Work; and if any claims for such damage or injury (including death resulting therefrom) be made or asserted, whether or not such claims are based upon Turner's alleged active or passive negligence or participation in the wrong or upon any alleged breach of any statutory duty or obligation on the part of Turner, the Subcontractor agrees to indemnify and save harmless Turner, its officers, agents, servants and employees from and against any and all such claims, and further from and against any and all loss, cost, expense, liability, damage or injury, including legal fees and disbursements, that Turner, its officers, agents, servants or employees may directly or indirectly sustain, suffer or incur as a result thereof and the Subcontractor agrees to and does hereby assume, on behalf of Turner, its officers, agents, servants and employees, the defense of any action at law or in equity which may be brought against Turner, its officers, agents, servants or employees upon or by reason of such claims and to pay on behalf of Turner, its officers, agents, servants and employees, upon its demand, the amount of any judgment that may be entered against Turner, its officers, agents, servants or employees in any such action. In the event that any such claims, loss, cost, expense, liability, damage or injury arise or are made, asserted or threatened against Turner, its officers, agents, servants or employees, Turner shall have the right to withhold from any payments due or to become due to the Subcontractor an amount sufficient in its judgment to protect and indemnify it and its officers, agents, servants and employees from and against any and all such claims, loss, cost, expense, liability, damage or injury, including legal fees and disbursements, or Turner, in its discretion, may require the Subcontractor to furnish a surety bond satisfactory to Turner guaranteeing such protection, which bond shall be furnished by the Subcontractor within five (5) days after written demand has been made therefor.

Compensation and Liability Insurance

Before commencing the Work, the Subcontractor shall procure and maintain, at its own expense, until completion and final acceptance of the Work at least the following insurance from insurance companies satisfactory to Turner:

1. WORKMEN'S COMPENSATION AND EMPLOYERS' LIABILITY INSURANCE in accordance with the laws of the State in which the Work is situated.

2. CONTRACTORS' PUBLIC LIABILITY INSURANCE INCLUDING CONTRACTUAL LIABILITY INSURANCE AGAINST THE LIABILITY ASSUMED HEREINABOVE, and including CONTRACTORS' PROTECTIVE LIABILITY INSURANCE if the Subcontractor sublets to another all or any portion of the Work, with the following minimum limits:

Bodily Injury, including death:	$ 500,000.00	per person
	$ 1,000,000.00	per accident
Property damage:	$ 1,000,000.00	per accident
	$ 1,000,000.00	aggregate per policy year

3. AUTOMOBILE LIABILITY INSURANCE covering all owned, non-owned and hired automobiles used in connection with the Work, with the following minimum limits:

Bodily Injury, including death:	$ 500,000.00	per person
	$ 1,000,000.00	per accident
Property damage:	$ 1,000,000.00	per accident

* thirty (30)

INITIALED

Before commencing the Work, the Subcontractor shall furnish a certificate, satisfactory to Turner, from each insurance company showing that the above insurance is in force, stating policy numbers, dates of expiration, and limits of liability thereunder, and further providing that the insurance will not be cancelled or changed until the expiration of at least [illegible] days after written notice of such cancellation or change has been mailed to and received by Turner. The Owner shall be named as an additional insured.

If the Subcontractor fails to procure and maintain such insurance, Turner shall have the right to procure and maintain the said insurance for and in the name of the Subcontractor and the Subcontractor shall pay the cost thereof and shall furnish all necessary information to make effective and maintain such insurance.

Bonds

ARTICLE XXIV. The Subcontractor shall furnish to Turner a performance bond in the amount of $17,995.0 and a separate payment bond in the amount of $ 8,998.00, the form and content of such bonds and the Surety or Sureties thereon to be satisfactory to Turner.

Entire Agreement

ARTICLE XXV. This Agreement constitutes the entire agreement between the parties hereto. No oral representations or other agreements have been made by Turner except as stated in this Agreement. This Agreement may not be changed in any way except as herein provided, and no term or provision hereof may be waived by Turner except in writing signed by its duly authorized officer or agent. The marginal descriptions of any term or provision of this Agreement are for convenience only and shall not be deemed to limit, restrict or alter the content, meaning or effect thereof.

The said parties, for themselves, their heirs, executors, administrators, successors and assigns, do hereby agree to the full performance of all of the terms and provisions herein contained.

In Witness Whereof the parties to these presents have hereunto set their hands as of the day and year first above written.

TURNER CONSTRUCTION COMPANY
As Agent for the Owner

In the Presence of:

By: ______
R. R. Peterman ~~Vice-President~~
Operations Manager

Coast Roof Co.
Subcontractor

In the Presence of:

x X Cora M. [illegible]

X By: X ______
Robert H. Lintz
President
Official Title

Subcontractor's California State Unemployment Ins. No. X 101 1116 9727771
(Insert State and Register No. for State in which the Work is to be performed)

Subcontractor's License No. X 1 .657
(Insert License No., if any, for State or locality in which the Work is to be performed)

RRP:PDB:yf

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT

AMENDMENTS TO SUBCONTRACT AGREEMENT

A. Article X. The Architect and Turner have no obligation to the Subcontractor to discover unsound, defective or improper work.

B. Article XIV. The Subcontractor's agreement to save harmless and indemnify Turner shall also include the Architect.

C. Article XVII. The Subcontractor's agreement to indemnify, protect and save harmless Turner shall also include the Architect.

D. Article XXI. Addendum #1 dated April 21, 1971 issued by Skidmore, Owings, & Merrill changes the Guarantee Period for labor and materials furnished on this project to three (3) years after substantial completion.

INITIALED

SOUTHWEST REGIONAL LABORATORY FOR
EDUCATIONAL RESEARCH AND DEVELOPMENT
Agreement No. 2790-M-24

Coast Roof Co.

ADDITIONAL PROVISIONS

BUILT-UP BITUMINOUS ROOF SYSTEM, MEMBRANE WATERPROOFING AND METALLIC WATERPROOFING

1. The "Contract Documents" upon which this Agreement is based are as follows:

   A. All Drawings, Specifications and Addenda as listed in Exhibit "A", Revised May 3, 1971, attached hereto and a part hereof.

   B. Standard Requirements as shown in Exhibit "B", attached hereto and a part hereof.

2. All work shown on the Plans and in the designated Section of the Specifications is a part of the Work; as a further clarification, however, the Work includes, but is not limited to, the following:

   A. Shop drawings, samples and data, as required.

   B. Furnishing and installation of:

      (1). Built-up bituminous roof system.

      (2). Membrane waterproofing.

      (3). Metallic waterproofing.

   C. Maintenance and guarantees, as required by Specifications.

3. The following items are not a part of the Work.

   A. Sheet metal work.

   B. Wood nailers.

4. The Subcontractor agrees that the prices charged and the wages and salaries paid under this Agreement are not in excess of the maximum prices, wages and salaries established by the Order of August 15, 1971 of the President of the United States and any order or regulation issued pursuant thereto by any delegated Agency or Office of United States authority.

5. The Subcontractor agrees that each invoice or requisition for payment presented to Turner shall have affixed to it the following wording:

   > "The Subcontractor certifies that, to the best of its knowledge and belief, it is in full compliance with Executive Order No. 11615, dated August 15, 1971, of the President of the United States, providing for the stabilization of prices, rents, wages and salaries."

INITIALED

Turner Construction Company
FOUNDED 1902
445 SOUTH FIGUEROA STREET, LOS ANGELES, CALIFORNIA 90017
TELEPHONE: 213-683-1430

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT

LOS ALAMITOS, CALIFORNIA

April 15, 1971
Revised May 3, 1971

1. Drawings, as prepared by Skidmore, Owings & Merrill:

DRAWING NUMBER	TITLE	REV. NO.	DATE
ARCHITECTURAL			
A-1	1st Floor Plan		3/31/71
A-2	2nd Floor Plan		3/31[illegible]
A-3	Roof Plan		3/31[illegible]
A-4	Elevations		3/31/71
A-5	Elevations and Sections		3/31[illegible]
A-101	Curtain Wall		3/31[illegible]
A-102	Curtain Wall		3/31/71
A-103	Curtain Wall		3/31[illegible]
A-104	Curtain Wall		3/31[illegible]
A-201	Finish Schedule		3/31/71
A-202	Partition Types and Details		3/31[illegible]
A-203	Door Schedule		3/31[illegible]
A-204	Door Details		3/31/7[illegible]
A-205	Stairs No. 1 & 2		3/31/71
A-206	Stairs No. 3 & 4		3/31[illegible]
A-207	Elevator		3/31[illegible]
A-208	Toilets		3/31/71
A-209	Audio-Visual Studio		3/31[illegible]
A-210	Miscellaneous		2/26[illegible]
A-211	Miscellaneous		2/26/71
A-301	Ceiling Details		3/31[illegible]
A-302	1st Floor Reflected Ceiling Plan		3/31[illegible]
A-303	2nd Floor Reflected Ceiling Plan		3/31/71
CIVIL			
C-1	Location Map Legend and Notes		3/31/71
C-2	Site Layout, Grading, Paving and Utilities-Bldg. Area	(Delta I)	4/21[illegible]
C-3	Site Layout, Grading, Paving and Utilities-Park. Area	(Delta I)	4/21[illegible]
C-4	Sanitary Sewer and Storm Drain Profiles		3/31/71
C-5	Water System Profiles and Details		3/31[illegible]
C-6	Miscellaneous Details	(Delta 1)	4/21[illegible]
C-100	Public Improvements, Storm Drain Sanitary Sewer and Domestic Water Connections		4/22[illegible]

INITIALED

DRAWING NUMBER	TITLE	REV. NO.	DATE
LANDSCAPE			
L-1	Landscape Planting Plan	(Delta I)	4/21/7
[illegible]-2	Landscape Planting Plan	(Delta I)	4/21/7
L-3	Landscape Details		3/31/7
L-4	Landscape Irrigation Plan	(Delta I)	4/21/7
[illegible]-5	Landscape Irrigation Plan	(Delta I)	4/21/7
L-6	Irrigation Details		3/31/7
STRUCTURAL			
S-1	General Notes and Typical Details	(Delta I)	4/21/7
[illegible]-2	Foundation and 1st Floor Plan	(Delta I)	4/21/7
[illegible]-3	Foundation Details	(Delta I)	4/21/7
S-4	2nd Floor Plan	(Delta I)	4/21/7
S-5	Roof Plan	(Delta I)	4/21/7
[illegible]-6	Metal Deck Plan	(Delta I)	4/21/7
S-7	Metal Deck Details	(Delta I)	4/21/7
S-8	Steel Details	(Delta I)	4/21/7
[illegible]-9	Miscellaneous	(Delta I)	4/21/7
MECHANICAL			
[illegible]-1	Schedule		3/31/7
M-2	Schedule and Flow Diagram		3/31/7
[illegible]-3	1st Floor Plan		3/31/7
[illegible]-4	2nd Floor Plan		3/31/7
M-5	Equipment Rooms and Section		3/31/7
[illegible]-6	Details		3/31/7
[illegible]-7	Controls		3/31/7
PLUMBING			
P-1	Roof Plan Legend, Schedules and Details		3/31/7
P-2	1st Floor Plan		3/31/7
[illegible]-3	2nd Floor Plan		3/31/7
ELECTRICAL			
[illegible]-1	Site Plan and Symbol List		3/31/7
E-2	1st Floor Plan Lighting		3/31/7
E-3	1st Floor Plan Power		3/31/7
[illegible]-4	2nd Floor Plan Lighting		3/31/7
E-5	2nd Floor Plan Power		3/31/7
E-6	Schedules		3/31/7
[illegible]-7	Riser Diagrams and Details		3/31/7

A. Specifications as prepared by:

SKIDMORE, OWINGS & MERRILL
San Francisco, California

Volume # 1	General Requirements	3/31/71
Volume # 2	General Construction	3/31/71
Volume # 3	Mechanical and Electrical	3/31/71
Addendum #1		4/21/71
Addendum #2		4/23/71

EXHIBIT "B"

STANDARD REQUIREMENTS

1. Nothing contained in Article XXIII of this Agreement shall be deemed to obligate the Subcontractor to indemnify Turner Construction Company, its officers, agents, servants or employees, against liability for damages or any other loss, damage or expense sustained, suffered or incurred on account of death or bodily injury to persons or injury to property caused by the sole negligence or willful misconduct of Turner Construction Company or any of its officers, agents, servants, employees or other subcontractors directly responsible to Turner Construction Company. Except as above stated, all of the terms and provisions of Article XXIII shall remain in full force and effect.

2. Article XIII of this Agreement (Cleaning-up) is hereby changed to read as follows: On lines 3 and 4, the words "as designated by Turner from which it shall be removed by Turner from the premises without Charge" are deleted. The words "and removed from the premises by the Subcontractor, to onsite bins provided by others" are inserted in lieu thereof.

3. Equal Opportunity/Facilities Non-Discrimination:

   The Subcontractor shall maintain and enforce the "Equal opportunity Clause" as specified in paragraph 15.4 of the General Requirements (Volume 1 of the Specifications.)

4. Turner is NOT responsible for providing:

   A. Parking facilities and/or any charges or expense in connection therewith for Subcontractor's employees and/or others in connection with the Work under this Agreement.

   B. Hoisting of Subcontractor's material or equipment.

   C. Scaffolding for Subcontractor's own work.

5. It shall be the responsibility of the Subcontractor to obtain any permits and/or permissions from governing bodies of the City of Los Alamitos and/or Seal Beach for any work that affects vehicular or pedestrian traffic pertaining to his work.

6. At the option of Turner Construction Company, certain items may be added to or deducted from the scope of the Work. In the event that Turner Construction Company shall elect to exercise this option, the Price will be increased or decreased by one of the optional methods described in Article IX of this Agreement, as Turner Construction Company may elect. In any event, the quantities and costs thereof shall be based on the Net Differential of the Additions and Deductions, for each change.

INITIALED

Attachment 30. General Conditions - Construction Contracts

INDEX TO GENERAL CONDITIONS

Article Number and Title — Page No.

ARTICLE 1: CONTRACT DOCUMENTS

1.1 Definitions GC-1
1.2 Execution, Correlation, Intent, and Interpretations GC-1
1.3 Copies Furnished and Ownership GC-2

ARTICLE 2: ARCHITECT

2.1 Definition GC-2
2.2 Administration of the Contract GC-3

ARTICLE 3: OWNER

3.1 Definition GC-5
3.2 Information and Services Required of the Owner GC-5
3.3 Owner's Right to Stop the Work GC-6
3.4 Owner's Right to Carry Out the Work GC-6

ARTICLE 4: CONTRACTOR

4.1 Definition GC-6
4.2 Review of Contract Documents GC-6
4.3 Supervision and Construction Procedures GC-7
4.4 Labor and Materials GC-7
4.5 Warranty GC-7
4.6 Taxes GC-7
4.7 Permits, Fees, and Notices GC-7
4.8 Cash Allowances GC-8
4.9 Superintendent GC-8
4.10 Responsibility for Those Performing the Work GC-8
4.11 Progress Schedule GC-8
4.12 Drawings and Specifications at the Site GC-9
4.13 Shop Drawings and Samples GC-9
4.14 Use of Site GC-10
4.15 Cutting and Patching of Work GC-10
4.16 Cleaning Up GC-10
4.17 Communications GC-11
4.18 Indemnification GC-11

ARTICLE 5: SUBCONTRACTORS

5.1 Definitions GC-12
5.2 Award of Subcontracts and Other Contracts for Portions of the Work GC-12
5.3 Subcontractural Relations GC-13
5.4 Payments to Subcontractors GC-14

Article Number and Title Page No.

ARTICLE 6: SEPARATE CONTRACTS

6.1 Owner's Right to Award Separate Contracts GC-14
6.2 Mutual Responsibility of Contractors GC-14
6.3 Cutting and Patching Under Separate Contracts GC-15
6.4 Owner's Right to Clean Up GC-15

ARTICLE 7: MISCELLANEOUS PROVISIONS

7.1 Law of the Place GC-15
7.2 Successors and Assigns GC-15
7.3 Written Notice GC-16
7.4 Claims for Damages GC-16
7.5 Performance Bond and Labor and Material Payment Bond GC-16
7.6 Rights and Remedies GC-16
7.7 Royalties and Patents GC-16
7.8 Tests GC-17
7.9 Interest GC-17
7.10 Arbitration GC-17

ARTICLE 8: TIME

8.1 Definitions GC-18
8.2 Progress and Completion GC-18
8.3 Delays and Extensions of Time GC-18
8.4 Extension of Time Due to Weather GC-19

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 Contract Sum GC-19
9.2 Schedule of Values GC-20
9.3 Progress Payments GC-20
9.4 Certificates for Payment GC-20
9.5 Payments Withheld GC-21
9.6 Failure of Payment GC-22
9.7 Substantial Completion and Final Payment GC-22

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 Safety Precautions and Programs GC-23
10.2 Safety of Persons and Property GC-23
10.3 Emergencies GC-24

ARTICLE 11: INSURANCE

11.1 Contractor's Liability Insurance GC-25
11.2 Owner's Laibility Insurance GC-26
11.3 Property Insurance GC-26
11.4 Loss of Use Insurance GC-27

Article Number and Title Page No.

ARTICLE 12: CHANGES IN THE WORK

12.1 Change Orders GC-27
12.2 Claims for Additional Costs GC-28
12.3 Minor Changes in the Work GC-29
12.4 Field Orders GC-29

ARRTICLE 13: UNCOVERING AND CORRECTION OF WORK

13.1 Uncovering Work GC-29
13.2 Correction of Work GC-29
13.3 Acceptance of Defective or Non-Conforming Work GC-30

ARTICLE 14: TERMINATION OF THE CONTRACT

14.1 Termination by the Contractor GC-30
14.2 Termination by the Owner GC-31

ARTICLE 15: ADDITIONAL CONDITIONS

15.1 Substitution of Materials and Equipment GC-31
15.2 Federal Inspection GC-32
15.3 Lands and Rights-Of-Way GC-32
15.4 Equal Opportunity GC-32
15.5 Prevailing Wages GC-33
15.6 Contract Work Hours Standards Act - Overtime Compensation GC-35
15.7 Apprentices GC-35
15.8 Payrolls and Basic Records GC-35
15.9 Compliance With Copeland Regulations GC-36
15.10 Withholding of Funds GC-36
15.11 Subcontracts GC-36
15.12 Contract Termination - Debarment GC-37
15.13 Certification of Nonsegregated Facilities GC-37
15.14 Use and Occupancy of Project Prior to Acceptance by the Owner GC-38

* * * * *

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement, the Conditions of the Contract (General, Supplementary and other Conditions), Performance Bond, Labor and Material Payment Bond, the Drawings, the Specifications, all Addenda issued prior to execution of the Contract, and all Modifications thereto. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Architect pursuant to Subparagraph 1.2.5, or (4) a written order for a minor change in the Work issued by the Architect pursuant to Paragraph 12.3. A Modification may be made only after execution of the Contract.

1.1.2 THE CONTRACT

The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the bidding documents. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1.

1.1.3 THE WORK

The term Work includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.4 THE PROJECT

The Project is the total construction designed by the Architect of which the Work performed under the Contract Documents may be the whole or a part.

1.2 EXECUTION, CORRELATION, INTENT, AND INTERPRETATIONS

1.2.1 The Contract Documents shall be signed in not less than triplicate by the Owner and Contractor. If either the Owner or the Contractor or both do not sign the Conditions of the Contract, Drawings, Specifications, or any of the other Contract Documents, the Architect shall identify them.

1.2.2 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

1.2.3 The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. The intention of the Documents is to include all labor, materials, equipment and other items as provided in Subparagraph 4.4.1 necessary for the proper execution and completion of the Work. It is not intended that Work not covered under any heading, section, branch, class or trade of the Specifications shall be supplied unless it is required elsewhere in the Contract Documents or is reasonably inferable therefrom as being necessary to produce the intended results. Words which have well-known technical or trade meanings are used herein in accordance with such recognized meanings.

1.2.4 The organization of the Specifications into divisions, sections and paragraphs, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.5 Written interpretations, necessary for the proper execution or progress of the Work, in the form of drawings or otherwise, will be issued with reasonable promptness by the Architect and in accordance with any schedule agreed upon. Either party to the Contract may make written request to the Architect for such interpretations. Such interpretations shall be consistent with and reasonably inferable from the Contract Documents, and may be effected by Field Order.

1.3 COPIES FURNISHED AND OWNERSHIP

1.3.1 Unless otherwise provided in the Contract Documents, the Construction Manager will be furnished for distribution to the Contractor, free of charge, 2 copies of Drawings and Specifications for the execution of the Work. The Contractor shall pay the cost of production for all additional copies of Drawings and Specifications requested by him. Copies of Modifications issued after award of Contract will be furnished as follows:

1.3.1.1 Bulletins or other typed material: 2 copies

1.3.1.2 Drawings : 2 blueline prints

1.3.2 All Drawings, Specifications and copies thereof furnished by the Architect are and shall remain his property. They are not to be used on any other project, and, with the exception of one contract set for each party to the Contract, are to be returned to the Architect on request at the completion of the Work.

ARTICLE 2

ARCHITECT

2.1 DEFINITION

2.1.1 The Architect is the person or organization licensed to practice architecture and identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Architect means the Architect or his authorized representative. The word

"Architect/Engineer" when used in any one of the Documents, shall be considered synonomous with the term "Architect".

2.1.2 Nothing contained in the Contract Documents shall create any contractual relationship between the Architect and the Contractor.

2.2 ADMINISTRATION OF THE CONTRACT

2.2.1 The Architect will provide general Administration of the Construction Contract, including performance of the functions hereinafter described. The Architect shall forward all communications to the Contractor through the Construction Manager.

2.2.2 The Architect will be the Owner's representative during construction and until final payment. The Architect will have authority to act on behalf of the Owner to the extent provided in the Contract Documents, unless otherwise modified by written instrument which will be shown to the Contractor. The Architect will advise and consult with the Owner, and all of the Owner's instructions to the Contractor shall be issued through the Architect.

2.2.3 The Construction Manager and the Architect shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so they may perform their functions under the Contract Documents.

2.2.4 The Architect will make periodic visits to the site to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. On the basis of his on-site observations as an architect, he will keep the Owner informed of the progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor. The Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

2.2.5 Based on such observations and the Contractor's Applications for Payment, the Architect will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.2.6 The Architect will be, in the first instance, the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder by both the Owner and Contractor. The Architect will, within a reasonable time, render such interpretations as he may deem necessary for the proper execution or progress of the Work..

2.2.7 Claims, disputes and other matters in question between the Contractor and the Owner relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be referred initially to the Architect for decision which he will render in writing within a reasonable time.

2.2.8 All interpretations and decisions of the Architect shall be consistent with the intent of the Contract Documents. In his capacity as interpreter and judge, he will exercise his best efforts to insure faithful performance by both the Owner and the Contractor and will not show partiality to either.

2.2.9 The Architect's decisions in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents.

2.2.10 Any claim, dispute or other matter that has been referred to the Architect, except those relating to artistic effect as provided in Subparagraph 2.2.9 and except any which have been waived by the making or acceptance of final payment as provided in Subparagraphs 9.7.5 and 9.7.6, shall be subject to arbitration upon the written demand of either party. However, no demand for arbitration of any such claim, dispute or other matter may be made until the earlier of:

2.2.10.1 The date on which the Architect has rendered his written decision, or

2.2.10.2 The tenth day after the parties have presented their evidence to the Architect or have been given a reasonable opportunity to do so, if the Architect has not rendered his written decision by that date.

2.2.11 If a decision of the Architect is made in writing and states that it is final but subject to appeal, no demand for arbitration of a claim, dispute or other matter covered by such decision may be made later than thirty days after the date on which the party making the demand received the decision. The failure to demand arbitration within said thirty days' period will result in the Architect's decision becoming final and binding upon the Owner and the Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede any arbitration proceedings except where the decision is acceptable to the parties concerned.

2.2.12 The Architect will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his reasonable opinion, he considers it necessary or advisable to insure the proper implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work as provided in Subparagraph 7.8.2 whether or not such Work be then fabricated, installed or completed. However, neither the Architect's authority to act under this Subparagraph 2.2.12, nor any decision made by him in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Architect to the Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.

2.2.13 The Architect will review Shop Drawings and Samples as provided in Subparagraphs 4.13.1 through 4.13.3 inclusive.

2.2.14 The Architect will prepare Change Orders in accordance with Article 12, and will have authority to order minor changes in the Work as provided in Subparagraph 12.3.1.

2.2.15 The Architect will conduct inspections to determine the dates of Substanial Completion and final completion, will receive and review written guarantees and related documents required by the Contract and assembled by the Contractor and will issue a final Certificate for Payment.

2.2.16 If the Owner and Architect agree, the Architect will provide one or more full-time Project Representatives to assist the Architect in carrying out his responsibilities at the site. The duties, responsibilities and limitations of authority of any such Project Representative shall be as set forth in an exhibit to be incorporated in the Contract Documents.

2.2.17 The duties, responsibilities and limitations of authority of the Architect as the Owner's representative during construction as set forth in Articles 1 through 14 inclusive of these General Conditions will not be modified or extended without written consent of the Owner, the Contractor and the Architect.

2.2.18 The Architect will not be responsible for the acts or omissions of the Contractor, any Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.

2.2.19 In case of the termination of the employment of the Architect, the Owner shall appoint an architect against whom the Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former architect. Any dispute in connection with such appointment shall be subject to arbitration.

ARTICLE 3

OWNER

3.1 DEFINITION

3.1.1 The Owner is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or his authorized representative.

3.1.2 The Construction Manager is the person or organization identified as such in the Agreement and is referred to throughout in the Contract Documents as if singular in number and masculine in gender. The Construction Manager shall serve as Agent for and on behalf of the Owner in the performance of the Work.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall furnish all surveys describing the physical characteristics, legal limits and utility locations for the site of the Project.

3.2.2 The Owner shall secure and pay for easements for permanent structures or permanent changes in existing facilities.

3.2.3 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

3.2.4 The Owner shall issue all instructions to the Contractor through the Architect.

3.2.5 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Payment and Insurance in Articles 9 and 11 respectively.

3.3 OWNER'S RIGHT TO STOP THE WORK

3.3.1 If the Contractor fails to correct defective Work or persistently fails to supply materials or equipment in accordance with the Contract Documents, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision of the Contract, the Owner may, after seven days' written notice to the Contractor and without prejudice to any other remedy he may have, make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including the cost of the Architect's additional services made necessary by such default, neglect or failure. The Architect must approve both such action and the amount charged to the Contractor. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his autherized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Architect any error, inconsistency or omission he may discover. The Contractor shall not be liable to the Owner or the Architect for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. The Contractor shall do no Work without Drawings, Specifications or Modifications.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequencies and procedures and for coordinating all portions of the Work under the Contract.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise specifically noted, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him.

4.5 WARRANTY

4.5.1 The Contractor warrants to the Owner and the Architect that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not so conforming to these standards may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

4.6 TAXES

4.6.1 The Contractor shall pay all sales, consumer, use and other similar taxes required by law.

4.7 PERMITS, FEES, AND NOTICES

4.7.1 The Contractor shall secure and pay for all permits, governmental fees and licenses necessary for the proper execution and completion of the Work, which are applicable at the time the bids are received. It is not the responsibility of the Contractor to make certain that the Drawings and Specifications are in accordance with applicable laws, statutes, building codes and regulations.

4.7.2 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the Work. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Architect in writing, and any necessary changes shall be adjusted by appropriate Modification. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Architect, he shall assume full responsibility therefor and shall bear all costs attributable thereto.

4.8 CASH ALLOWANCES

4.8.1 The Contractor shall include in his proposal the cash allowances stated in the Specifications. These stated allowances represent the net cost estimate of the materials and equipment delivered and unloaded at the site, and all applicable taxes. The Contractor's handling costs on the site, labor, installation costs, overhead, profit and other expenses contemplated for the cash allowance material and equipment shall be included in the Contract Sum since they are not included in the cash allowance estimates. The Contractor shall purchase the cash allowance materials and equipment as directed by the Architect on the basis of the lowest responsive bid of at least three competitive bids. If the actual cost of the materials and equipment delivered and unloaded at the site and all applicable taxes is more or less than the cash allowance estimates, the Contract Sum will be adjusted accordingly by Change Order.

4.9 SUPERINTENDENT

4.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall be satisfactory to the Construction Manager, and shall not be changed except with the consent of the Construction Manager, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications will be confirmed in writing. Other communications will be so confirmed on written request in each case.

4.10 RESPONSIBILITY FOR THOSE PERFORMING THE WORK

4.10.1 The Contractor shall be responsible to the Owner for the acts and omissions of all his employees and all Subcontractors, their agents and employees, and all other persons performing any of the Work under a contract with the Contractor.

4.11 PROGRESS SCHEDULE

4.11.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Construction Manager's and the Architect's approval an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents. This schedule shall indicate the dates for the starting and completion of the various stages of construction and shall be revised as required by the conditions of the Work, subject to the Construction Manager's recommendation and the Architect's approval.

4.11.2 Together with the estimated progress schedule for the Work, the Contractor shall also submit a schedule for submission of shop drawings and samples. The schedule shall indicate the dates on which the Contractor shall submit shop drawings and samples for each of the various sections of the Work. This schedule shall also allow ample time for the review of shop drawings and samples by the Construction Manager and the Architect.

4.12 DRAWINGS AND SPECIFICATIONS AT THE SITE

4.12.1 The Construction Manager shall maintain at the site for the Owner one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other Modifications, in good order and marked to record all changes made during construction. These shall be available to the Architect. The Drawings, marked to record all changes made during construction, shall be delivered to him for the Owner upon completion of the Work.

4.13 SHOP DRAWINGS AND SAMPLES

4.13.1 Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the Work.

4.13.2 Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to establish standards by which the Work will be judged.

4.13.3 The Contractor shall review, stamp with his approval and submit to the Construction Manager with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the work of any other contractor, all Shop Drawings and Samples required by the Contract Documents or subsequently by the Construction Manager and the Architect as covered by Modifications. Shop Drawings and Samples shall be properly identified and submitted as specified under SPECIAL CONDITIONS. At the time of submission the Contractor shall inform the Construction Manager and the Architect in writing of any deviation in the Shop Drawings or Samples from the requirements of the Contract Documents.

4.13.4 By approving and submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and of the Contract Documents.

4.13.5 The Construction Manager and the Architect will review and act on Shop Drawings and Samples with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Construction Manager's and the Architect's review of a separate item shall not indicate review of the complete assembly in which the item functions.

4.13.6 The Contractor shall make any corrections required by the Architect and the Construction Manager as specified under SPECIAL CONDITIONS. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Architect and the Construction Manager on previous submissions.

4.13.7 The Construction Manager's and the Architect's review of Shop Drawings or Samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Construction Manager and the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation, nor shall the Construction Manager's and the Architect's review relieve the Contractor from responsibility for errors or omissions in the Shop Drawings or Samples.

4.13.8 No portion of the Work requiring a Shop Drawing or Sample submission shall be commenced until the submission has been reviewed and acted upon by the Construction Manager and the Architect. All such portions of the Work shall be in accordance with such reviewed Shop Drawings and Samples.

4.14 USE OF SITE

4.14.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.15 CUTTING AND PATCHING OF WORK

4.15.1 The Contractor shall do all cutting, fitting or patching of his Work that may be required to make its several parts fit together properly, and shall not endanger any Work by cutting, excavating or otherwise altering the Work or any part of it.

4.15.2 All cutting shall be done promptly and all repairs shall be made as necessary to leave the Work in good condition, including all cutting and fitting of masonry, concrete, metal, wood, plaster, and other materials as specified or required for proper assembly, fabrication, installation, and completion of all Work under the Contract, and including patching work as may be necessary. If for any reason a hole or tapping is necessary in any concrete, masonry, or tile Work after such material is in place, such hole or tapping shall be made by drilling.

4.15.3 Any cost caused by defective or ill-timed Work shall be borne by the party responsible thereof. In case of dispute, the responsibility thereof shall be decided by the Architect.

4.15.4 Structural members shall not be cut except by written authority of the Architect. Work done contrary to or without such authority is at the Contractor's risk, subject to replacement at his own expense if so directed by the Architect or the Construction Manager.

4.15.5 Permission to patch any area or items of Work shall not constitute a waiver of the Architect's right to require complete removal and replacement of said areas or items of Work, if, in the Architect's opinion said patching does not satisfactorily restore quality and appearance of same.

4.16 CLEANING UP

4.16.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations, and shall perform general cleaning as required to facilitate progress of the Work.

Immediately after unpacking materials, all packing case lumber or other lumber or other materials, excelsior, wrappings, and other like flammable rubbish shall be collected and removed from the building and the premises by the Contractor.

4.16.2 Should the Owner desire to occupy completed portions of the Work prior to the date of completion for the entire Work, the Contractor shall, when directed by the Construction Manager, perform the final cleaning specified below. The Construction Manager shall not direct the Contractor to proceed with final cleaning, until he has received written notice from the Architect.

4.16.3 Upon completion of the Work, the Contractor shall remove all rubbish from and about the building, all tools, scaffolding, surplus materials, and shall leave his Work "broom clean" or its equivalent, unless more exactly specified, and in general leave the completed Work sufficiently clean as determined by the Architect.

4.16.4 If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be charged to the Contractor as provided in Paragraph 3.4.

4.17 COMMUNICATIONS

4.17.1 The Contractor shall forward all communications to the Owner and the Architect through the Construction Manager.

4.18 INDEMNIFICATION

4.18.1 The Contractor shall defend, indemnify and save harmless the Owner, the Construction Manager, and the Architect, and anyone acting for or on behalf of any of them, from any and all claims or demands for bodily injury (including death), including bodily injury or death of the Contractor's own employees, and claims for loss or damage to property, and including costs of suit and attorney fees, directly or indirectly arising or alleged to arise out of the performance of or the failure to perform the Work or the conditions of the Work, the job site, adjoining land or driveways, streets, or alleys used in connection with the performance of the Work, and from any and all claims by workmen, suppliers or Subcontractors who are involved in the performance of the Work; whether or not the Owner, the Construction Manager, or the Architect may have been passively or contributorily negligent in connection with such bodily injury (including death) or loss or damage to any property (or claim or claims therefor). The obligations set forth in this Article shall, but not by way of limitation, specifically include all claims directly or indirectly arising or alleged to arise under any scaffolding, structural Work or safe place law or any law with respect to protection of adjacent landowners, but do not include any claims arising solely from the active negligence of the party asking to be defended, indemnified or saved harmless. In the event of any such injury (including death), loss or damage (or claim or claims therefor), the Contractor shall give immediate notice thereof to the Owner, the Construction Manager, and the Architect.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or organization who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

5.1.2 A Sub-subcontractor is a person or organization who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.1.3 Nothing contained in the Contract Documents shall create any contractual relation between the Owner or the Architect and any Subcontractor or Sub-subcontractor.

5.1.4 The Contractor may utilize the services of only those Subcontractors who have not been disqualified under existing Federal laws and regulations from participating in Federally assisted construction projects.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise specified in the Contract Documents or in the Instructions to Bidders, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Construction Manager and the Architect in writing for acceptance by the Owner and the Architect a list of the names of the Subcontractors proposed for all portions of the Work. The Architect shall promptly notify the Contractor in writing if either the Owner, the Construction Manager, or the Architect, after due investigation, has reasonable objection to any Subcontractor on such list and does not accept him. Failure of the Owner, the Construction Manager, or Architect to make objection promptly to any Subcontractor on the list shall constitute acceptance of such Subcontractor.

5.2.2 The Contractor shall not contract with any Subcontractor or any person or organization (including those who are to furnish materials or equipment fabricated to a special design) proposed for portions of the Work designated in the Contract Documents or in the Instructions to Bidders or, if none is so designated, with any Subcontractor proposed for the principal portions of the Work who has been rejected by the Owner, the Construction Manager, and the Architect. The Contractor will not be required to contract with any Subcontractor or person or organization against whom he has a reasonable objection.

5.2.3 If the Owner, the Construction Manager, or Architect refuses to accept any Subcontractor or person or organization on a list submitted by the Contractor in response to the requirements of the Contract Documents or the Instructions to Bidders, the Contractor shall submit an acceptable substitute and the Contract Sum shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued; however, no increase in the Contract Sum shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting for acceptance any list or lists of names as required by the Contract Documents or the Instructions to Bidders.

5.2.4 If the Owner, the Construction Manager, or the Architect requires a change of any proposed Subcontractor or person or organization previously accepted by them, the Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued.

5.2.5 The Contractor shall not make any substitution for any Subcontractor or person or organization who has been accepted by the Owner, the Construction Manager, and the Architect, unless the substitution is acceptable to all parties.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 All work performed for the Contractor by a Subcontractor shall be pursuant to an appropriate agreement between the Contractor and the Subcontractor (and where appropriate between Subcontractors and Sub-subcontractors) which shall contain provisions that:

5.3.1.1 preserve and protect the rights of the Owner, the Construction Manager, and the Architect under the Contract with respect to the Work to be performed under the subcontract so that the subcontracting thereof will not prejudice such rights;

5.3.1.2 require that such Work be performed in accordance with the requirements of the Contract Documents;

5.3.1.3 require submission to the Contractor of applications for payment under each subcontract to which the Contractor is a party, in reasonable time to enable the Contractor to apply for payment in accordance with Article 9;

5.3.1.4 require that all claims for additional costs, extensions of time, damages for delays or otherwise with respect to subcontracted portions of the Work shall be submitted to the Contractor (via any Subcontractor or Sub-subcontractor where appropriate) in sufficient time so that the Contractor may comply in the manner provided in the Contract Documents for like claims by the Contractor upon the Owner;

5.3.1.5 waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance described in Paragraph 11.3, except such rights as they may have to the proceeds of such insurance held by the Owner as trustee under Paragraph 11.3;

5.3.1.6 obligate each Subcontractor specifically to consent to the provisions of this Paragraph 5.3; and

5.3.1.7 the Contractor agrees to bind every Subcontractor and every

Subcontractor agrees to be bound by the terms of the Agreement, GENERAL CONDITIONS, SPECIAL CONDITIONS, the Drawings, and Specifications as far as applicable to his Work, including the provisions of this paragraph.

5.4 PAYMENTS TO SUBCONTRACTORS

5.4.1 The Contractor shall pay each Subcontractor, upon receipt of payment from the Owner, an amount equal to the percentage of completion allowed to the Contractor on account of such Subcontractor's Work, less the percentage retained from payments to the Contractor. The Contractor shall also require each Subcontractor to make similar payments to his subcontractors.

5.4.2 If the Architect fails to issue a Certificate for Payment for any cause which is the fault of the Contractor and not the fault of a particular Subcontractor, the Contractor shall pay that Subcontractor on demand, made at any time after the Certificate for Payment should otherwise have been issued, for his Work to the extent completed, less the retained percentage.

5.4.3 The Contractor shall pay each Subcontractor a just share of any insurance moneys received by the Contractor under Article 11, and he shall require each Subcontractor to make similar payments to his subcontractors.

5.4.4 The Architect may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding percentages of completion certified to the Contractor on account of Work done by such Subcontractors.

5.4.5 Neither the Owner nor the Architect shall have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.

ARTICLE 6

SEPARATE CONTRACTS

6.1 OWNER'S RIGHT TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to award other contracts in connection with other portions of the Project under these or similar Conditions of the Contract.

6.1.2 When separate contracts are awarded for different portions of the Project, "the Contractor" in the contract documents in each case shall be the contractor who signs each separate contract.

6.2 MUTUAL RESPONSIBILITY OF CONTRACTORS

6.2.1 The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate his Work with theirs.

6.2.2 If any part of the Contractor's Work depends for proper execution or results upon the work of any other separate contractor, the Contractor shall inspect and promptly report to the Architect, and the Construction Manager any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper to receive his Work, except as to defects which may develop in the other separate contractor's work after the execution of the Contractor's Work.

6.2.3 Should the Contractor cause damage to the work or property of any separate contractor on the Project, the Contractor shall, upon due notice, settle with such other contractor by agreement or arbitration, if he will so settle. If such separate contractor sues the Owner or initiates an arbitration proceeding on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall defend such proceedings at the Owner's expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitration costs which the Owner has incurred.

6.3 CUTTING AND PATCHING UNDER SEPARATE CONTRACTS

6.3.1 The Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work except as otherwise specifically provided in the Contract Documents. The Contractor shall not endanger any work of any other contractors by cutting, excavating or otherwise altering any work and shall not cut or alter the work of any other contractor except with the written consent of the Architect.

6.3.2 Any costs caused by defective or ill-timed work shall be borne by the party responsible therefor.

6.4 OWNER'S RIGHT TO CLEAN UP

6.4.1 If a dispute arises between the separate contractors as to their responsibility for cleaning up as required by Paragraph 4.16, the Owner may clean up and charge the cost thereof to the several contractors as the Architect shall determine to be just.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 LAW OF THE PLACE

7.1.1 The Contract shall be governed by the law of the place where the Project is located.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each binds himself, his partners, sucessors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract

Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner.

7.3 WRITTEN NOTICE

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

7.4 CLAIMS FOR DAMAGES

7.4.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The Contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum or in a penal sum not less than that prescribed by State, Territorial or local law, as security for the payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Labor and Material Payment Bond may be in one or in separate instruments in accordance with local law and shall be delivered to the Owner not later than the date of execution of the Contract.

7.6 RIGHTS AND REMEDIES

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.7 ROYALTIES AND PATENTS

7.7.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner, the Construction Manager, and the Architect, harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Architect.

7.8 TESTS

7.8.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be inspected, tested or approved, the Contractor shall give the Architect timely notice of its readiness and of the date arranged so the Architect may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests and approvals unless otherwise provided.

7.8.2 If after the commencement of the Work, the Architect determines that any Work requires special inspection, testing or approval which Subparagraph 7.8.1 does not include, he will, upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as in Subparagraph 7.8.1. If such special inspection or testing reveals a failure of the Work to comply (1) with the requirements of the Contract Documents or (2) with respect to the performance of the Work, with laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof, including the Architect's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.8.3 Required certificates of inspection, testing or approval shall be secured by the Contractor and promptly delivered by him to the Architect.

7.8.4 If the Architect wishes to observe the inspections, tests or approvals required by this Paragraph 7.8, he will do so promptly and, where practicable, at the source of supply.

7.8.5 Neither the observations of the Architect nor the Construction Manager in their Administration of the Construction Contract, nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the Contract Documents.

7.9 INTEREST

7.9.1 Any moneys not paid when due to either party under this Contract shall bear interest at the legal rate in force at the place of the Project.

7.10 ARBITRATION

7.10.1 All claims, disputes and other matters in question arising out of, or relating to, this Contract or the breach thereof, except as set forth in Subparagraph 2.2.9 with respect to the Architect's decisions on matters relating to artistic effect, and except for claims which have been waived by the making or acceptance of final payment as provided by Subparagraphs 9.7.5 and 9.7.6, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining unless the parties mutually agree otherwise. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

7.10.2 Notice of the demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect. The demand for arbitration shall be made within the time limits specified in Subparagraphs 2.2.10 and 2.2.11 where applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

7.10.3 The Contractor shall carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise agreed by him and the Owner in writing.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 The Contract Time is the period of time allotted in the Contract Documents for completion of the Work.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the Work or designated portion thereof for the use for which it is intended.

8.1.4 The term day as used in the Contract Documents shall mean calendar day.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall complete it within the Contract Time.

8.2.3 If a date or time of completion is included in the Contract, it shall be the Date of Substantial Completion as defined in Subparagraph 8.1.3, including authorized extensions thereto, unless otherwise provided.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner, the Construction Manager, or the Architect, or by any employee of either, or by any separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, unavoidable casualties or any causes beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by any cause which the Architect determines may justify the delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

8.3.2 All claims for extension of time shall be made in writing to the Architect no more than twenty days after the occurrence of the delay; otherwise they shall be waived. In the case of a continuing cause of delay only one claim is necessary.

8.3.3 If no schedule or agreement is made stating the dates upon which written interpretations as set forth in Subparagraph 1.2.5 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen days after demand is made for them, and not then unless such claim is reasonable.

8.3.4 This Paragraph 8.3 does not exclude the recovery of damages for delay by either party under other provisions of the Contract Documents.

8.4 EXTENSION OF TIME DUE TO WEATHER

8.4.1 The Work shall be based on full consideration of the effect of inclement weather normally to be expected during the construction period both as to cost and time for completing the Work.

8.4.2 The Architect will decide that an extension of time is justified only if the actual weather encountered is materially more severe than the normal weather conditions over the previous ten years as evidenced by official weather bureau reports.

8.4.3 Notice of apparent delays due to weather shall be made in writing but extensions of time will not be approved until after the overall actual weather conditions during the construction period can be evaluated. The amount of any extension will be based on actual delays to those operations which are determined to be controlling factors in the progress of the Work as established by the progress schedules.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Agreement and is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values of the various portions of the Work, including quantities if required by the Architect, or the Construction Manager, aggregating the total Contract Sum, divided so as to facilitate payments to Subcontractors in accordance with Paragraph 5.4, prepared in such form as specified or as the Architect, the Construction Manager, and the Contractor may agree upon, and supported by such data to substantiate its correctness as the Architect and the Construction Manager may require. Each item in the schedule of values shall include its proper share of overhead and profit. This schedule, when approved by the Construction Manager and agreed to by the Architect, shall be used only as a basis for the Contractor's Applications for Payment.

9.3 PROGRESS PAYMENTS

9.3.1 At least ten days before each progress payment falls due, the Contractor shall submit to the Architect an itemized Application for Payment, supported by such data substantiating the Contractor's right to payment as the Owner, the Construction Manager, or the Architect may require.

9.3.2 If payments are to be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site, or at some other location agreed upon in writing, such payments shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Construction Manager and the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest including applicable insurance and transportation to the site.

9.3.3 The Contractor warrants and guarantees that title to all Work, materials and equipment covered by an Application for Payment, whether incorporated in the Project or not, will pass to the Owner upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing the Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 If the Contractor has made Application for Payment as above, the Architect will, with reasonable promptness but not more than seven days after the receipt of the Application, issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as he determines to be properly due, or state in writing his reasons for withholding a Certificate as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on his observations at the site as provided in Subparagraph 2.2.4 and the data comprising the Application for

Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in his Certificate); and that the Contractor is entitled to payment in the amount certified. In addition, the Architect's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.7.2 have been fulfilled. However, by issuing a Certificate for Payment, the Architect shall not thereby be deemed to represent that he has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that he has reviewed the construction means, methods, techniques, sequences or procedures, or that he has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.

9.4.3 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Agreement.

9.4.4 No certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

9.5 PAYMENTS WITHHELD

9.5.1 The Architect may decline to approve an Application for Payment and may withhold his Certificate in whole or in part, to the extent necessary reasonably to protect the Owner, if in his opinion he is unable to make representations to the Owner as provided in Subparagraph 9.4.2. The Architect may also decline to approve any Applications for Payment or, because of subsequently discovered evidence or subsequent inspections, he may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in his opinion to protect the Owner from loss because of:

9.5.1.1 defective work not remedied,

9.5.1.2 third party claims filed or reasonable evidence indicating probable filing of such claims,

9.5.1.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,

9.5.1.4 reasonable doubt that the Work can be completed for the unpaid balance of the Contract Sum,

9.5.1.5 damage to another contractor.

9.5.1.6 reasonable indication that the Work will not be completed within the Contract Time, or

9.5.1.7 unsatisfactory prosecution of the Work by the Contractor.

9.5.2 When the above grounds in Subparagraph 9.5.1 are removed, payment shall be made for amounts withheld because of them.

9.6 FAILURE OF PAYMENT

9.6.1 If the Architect should fail to issue any Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner should fail to pay the Contractor within seven days after the date of payment established in the Agreement any amount certified by the Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner, the Construction Manager, and the Architect, stop the Work until payment of the amount owing has been received.

9.7 SUBSTANTIAL COMPLETION AND FINAL PAYMENT

9.7.1 When the Contractor determines that the Work or a designated portion thereof acceptable to the Owner is substantially complete, the Contractor shall prepare for submission to the Architect a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Architect on the basis of an inspection determines that the Work is substantially complete, he will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for maintenance, heat, utilities, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

9.7.2 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when he finds the Work acceptable under the Contract Documents and the Contract fully performed, he will promptly issue a final Certificate for Payment stating that to the best of his knowledge, information and belief, and on the basis of his observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable.

9.7.3 Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Architect (1) an Affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied, (2) consent of surety, if any, to final payment and (3), if required by the Owner or the Construction Manager, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner and the Construction Manager. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner and the Construction Manager to indemnify the Owner against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.7.4 If after Substantial Completion of the Work final completion thereof is materially delayed through no fault of the Contractor, and the Architect so confirms, the Owner shall, upon certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Subparagraph 7.5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.7.5 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

9.7.5.1 unsettled liens,

9.7.5.2 faulty or defective Work appearing after Substantial Completion.

9.7.5.3 failure of the Work to comply with the requirements of the Contract Documents, or

9.7.5.4 terms of any special guarantees required by the Contract Documents.

9.7.6 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and still unsettled.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

10.2.1.1 all employees on the Work and all other persons who may be affected thereby;

10.2.1.2 all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and

10.2.1.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

10.2.3 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.4 All damage or loss to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, shall be remedied by the Contractor, except damage or loss attributable to faulty Drawings or Specifications or to the acts or omissions of the Owner, the Construction Manager, or Architect or anyone employed by any of them or for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor.

10.2.5 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Owner, the Construction Manager, and the Architect.

10.2.6 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

11.1.1.1 claims under workmen's compensation, disability benefit and other similar employee benefit acts;

11.1.1.2 claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

11.1.1.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

11.1.1.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and

11.1.1.5 claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 4.18.

11.1.3 Certificates of Insurance acceptable to the Owner and the Construction Manager shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled until at least fifteen days' prior written notice has been given to the Owner and the Construction Manager.

11.1.4 The Contractor's Comprehensive General Liability Insurance and Automobile Liability Insurance required by Subparagraph 11.1.1 shall be in an amount not less than Five Hundred Thousand dollars ($500,000) for injuries, including accidental death, to any one person and subject to the same limit for each person, and in an amount not less than One Million dollars ($1,000,000) on account of one occurrence. The Contractor's Property Damage Liability Insurance shall be in an amount not less than One Million dollars ($1,000,000). Such policy shall be endorsed to provide coverage for the obligations of the Contractor pursuant to Paragraph 4.18.1. The Contractor shall either (1) require each of his Subcontractors to procure and to maintain during the life of his Subcontract, Subcontractors' Comprehensive General Liability, Automobile Liability, and Property Damage Liability Insurance of the type and in the same amounts as specified in this Subparagraph, or (2) insure the activity of his Subcontractors in his own policy.

11.2 OWNER'S LIABILITY INSURANCE

11.2.1 The Owner shall be responsible for purchasing and maintaining his own liability insurance and, at his option, may purchase and maintain such insurance as will protect him against claims which may arise from operations under the Contract.

11.3 PROPERTY INSURANCE

11.3.1 Until the Work is completed and accepted by the Owner, the Owner shall purchase and maintain property insurance upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Construction Manager, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of Fire, Extended Coverage, Vandalism and Malicious Mischief.

11.3.2 The Owner shall purchase and maintain such steam boiler and machinery insurance as may be required by the Contract Documents or by law. This insurance shall include the interests of the Owner, the Construction Manager, the Contractor, Subcontractors and Sub-subcontractors in the Work.

11.3.3 Any insured loss is to be adjusted with the Owner and made payable to the Owner as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortagee clause and of Subparagraph 11.3.8.

11.3.4 The Owner shall file a copy of all policies with the Contractor and the Construction Manager before an exposure to loss may occur. If the Owner does not intend to purchase such insurance he shall inform the Contractor and the Construction Manager in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of himself, his Subcontractors and the Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by failure of the Owner to purchase or maintain such insurance and so to notify the Contractor, then the Owner shall bear all reasonable costs properly attributable thereto.

11.3.5 If the Contractor requests in writing that insurance for special hazards be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.3.6 The Owner and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance provided under this Paragraph 11.3, except such rights as they may have to the proceeds of such insurance held by the Owner as trustee. The Contractor shall require similar waivers by Subcontractors and Sub-subcontractors in accordance with Clause 5.3.1.5.

11.3.7 If required in writing by any party in interest, the Owner as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of his duties. He shall deposit in a separate account any money so received, and he shall distribute it in accordance with such agreement as the parties in interest may reach, or in accordance with an award by arbitration in which case the procedure shall be as provided in Paragraph 7.10. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.

11.3.8 The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five days after the occurrence of loss to the Owner's exercise of this power, and if such objection be made, arbitrators shall be chosen as provided in Paragraph 7.10. The Owner as trustee shall, in that case, make settlement with the insurers in accordance with the directions of such arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.4 LOSS OF USE INSURANCE

11.4.1 The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

ARTICLE 12

CHANGES IN THE WORK

12.1 CHANGE ORDERS

12.1.1 The Owner, without invalidating the Contract, may order Changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such Changes in the Work shall be authorized by Change Order, and shall be executed under the applicable conditions of the Contract Documents.

12.1.2 A Change Order is a written order to the Contractor signed by the Owner and the Architect, issued after the execution of the Contract, authorizing a Change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order.

12.1.3 The cost or credit to the Owner resulting from a Change in the Work shall be determined in one or more of the following ways:

12.1.3.1 by mutual acceptance of a lump sum properly itemized;

12.1.3.2 by unit prices stated in the Contract Documents or subsequently agreed upon; or

12.1.3.3 by cost and a mutually acceptable fixed or percentage fee.

12.1.4 If none of the methods set forth in Subparagraph 12.1.3 is agreed upon, the Contractor, provided he receives a Change Order, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Architect on the basis of the Contractor's reasonable expenditures and savings, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Clause 12.1.3.3 above, the Contractor shall keep and present, in such form as the Architect and the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Pending final determination of cost to the Owner, payments on account shall be made on the Architect's Certificate for Payment. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in cost will be the amount of the actual net decrease as confirmed by the Architect. When both additions and credits are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase, if any.

12.1.5 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will create a hardship on the Owner or the Contractor, the applicable unit prices shall be equitably adjusted to prevent such hardship.

12.1.6 Should concealed conditions encountered in the performance of the Work below the surface of the ground be at variance with the conditions indicated by the Contract Documents or should unknown physical conditions below the surface of the ground of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, be encountered, the Contract Sum shall be equitably adjusted by Change Order upon claim by either party made within twenty days after the first observance of the conditions.

12.1.7 If the Contractor claims that additional cost is involved because of (1) any written interpretation issued pursuant to Subparagraph 1.2.5, (2) any order by the Owner to stop the Work pursuant to Paragraph 3.3 where the Contractor was not at fault, or (3) any written order for a minor change in the Work issued pursuant to Paragraph 12.3, the Contractor shall make such claim as provided in Paragraph 12.2.

12.2 CLAIMS FOR ADDITIONAL COST

12.2.1 If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Architect written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Subparagraph 10.3.1. No such claim shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by the Architect. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.3 MINOR CHANGES IN THE WORK

12.3.1 The Architect shall have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes may be effected by Field Order or by other written order. Such changes shall be binding on the Owner and the Contractor.

12.4 FIELD ORDERS

12.4.1 The Architect may issue written Field Orders which interpret the Contract Documents in accordance with Subparagraph 1.2.5 or which order minor changes in the Work in accordance with Paragraph 12.3 without change in Contract Sum or Contract Time. The Contractor shall carry out such Field Orders promptly.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any Work should be covered contrary to the request of the Architect, it must, if required by the Architect, be uncovered for his observation and replaced, at the Contractor's expense.

13.1.2 If any other Work has been covered which the Architect has not specifically requested to observe prior to being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by a separate contractor employed as provided in Article 6, and in that event the Owner shall be responsible for the payment of such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly correct all Work rejected by the Architect or the Construction Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including the cost of the Architect's and the Construction Manager's additional services thereby made necessary.

13.2.2 If, within one year after the Date of Substantial Completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 All such defective or non-conforming Work under Subparagraphs 13.2.1 and 13.2.2 shall be removed from the site where necessary, and the Work shall be corrected to comply with the Contract Documents without cost to the Owner.

13.2.4 The Contractor shall bear the cost of making good all work of separate contractors destroyed or damaged by such removal or correction.

13.2.5 If the Contractor does not remove such defective or non-conforming Work within a reasonable time fixed by written notice from the Architect, or the Construction Manager, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner may upon ten additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor including compensation for additional architectural services. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 If the Contractor fails to correct such defective or non-conforming Work, the Owner may correct it in accordance with Paragraph 3.4.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or non-conforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in the Contract Sum, or, if the amount is determined after final payment, it shall be paid by the Contractor.

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the Work is stopped for a period of thirty days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, or if the Work should be stopped for a period of thirty days by the Contractor for the Architect's failure to issue a Certificate for Payment as provided in Paragraph 9.6 or for the Owner's failure to make payment thereon as provided in Paragraph 9.6, then the Contractor may, upon seven days' written notice to the Owner, the Construction Manager, and the

Architect, terminate the Contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and damages.

14.2 TERMINATION BY THE OWNER

14.2.1 If the Contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, seven days' written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever method he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished.

14.2.2 If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Construction Manager's and the Architect's additional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The costs incurred by the Owner as herein provided shall be certified by the Architect.

ARTICLE 15

ADDITIONAL CONDITIONS

15.1 SUBSTITUTION OF MATERIALS AND EQUIPMENT

15.1.1 Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is, in the opinion of the Architect, of equal substance, appearance and function. It shall not be purchased or installed by the Contractor without the Architect's written approval.

15.1.2 All such requests shall be made within 30 calendar days after Notice to Proceed. No such request or resubmittal thereof will be considered unless made within the period specified, and unless made within that time, the particular material, article, or piece of equipment specified shall be furnished.

15.2 FEDERAL INSPECTION

15.2.1 The authorized representatives and agents of the Federal Government shall be permitted to inspect all Work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

15.3 LANDS AND RIGHTS-OF-WAY

15.3.1 Prior to the start of construction, the Owner shall obtain all lands and rights-of-way necessary for the execution and completion of Work to be performed under this Contract.

15.4 EQUAL OPPORTUNITY

15.4.1 During the performance of this Contract the Contractor agrees as follows:

15.4.1.1 The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor will take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by an appropriate agency of the Federal Government setting forth the requirements of this Equal Opportunity clause.

15.4.1.2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

15.4.1.3 The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

15.4.1.4 The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

15.4.1.5 The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by an appropriate agency of the Federal Government and by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

15.4.1.6 In the event of the Contractor's noncompliance with the Equal Opportunity conditions of this Contract or with any of such rules, regulations or orders, this Contract may be cancelled, terminated or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts or Federally assisted construction contracts, in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation or order of the Secretary of Labor, or as provided by law.

15.4.1.7 The Contractor will include all of Clauses 15.4.1.1 through 15.4.1.7 inclusive in every Subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any Subcontract or purchase order as the appropriate agency of the Federal Government may direct as a means of enforcing such provisions, including sanctions for non-compliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the appropriate agency of the Federal Government, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

15.4.2 Exemptions to the above Equal Opportunity conditions are Contracts and Subcontracts not exceeding $10,000, and Contracts and Subcontracts under which Work is performed outside the United States where no recruitment of workers within the United States is involved.

15.4.3 Unless otherwise provided, the above Equal Opportunity provisions are not required to be inserted in Sub-subcontracts except for Sub-subcontracts involving the performance of construction Work at the site of construction, in which case the provisions must be inserted in all such Sub-subcontracts.

15.5 PREVAILING WAGES

15.5.1 All mechanics and laborers employed or working directly upon the site of the Work shall be paid unconditionally, and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Copeland Regulations (29 Code of Federal Regulations, Part 3)), the full amounts due at time of payment computed at wage rates not less than the aggregate of the basic hourly rates and the rates of payments, contributions, or costs for any fringe benefits contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor or Subcontractor and such laborers and mechanics, and the wage determination decision shall be posted by the Contractor at the site of the Work in a prominent place where it can easily be seen by the workers.

15.5.2 The Contractor may discharge his obligation under Subparagraph 15.5.1 to workers in any classification for which the wage determination decision contains:

15.5.2.1 Only a basic hourly rate of pay, by making payment not less than such basic hourly rate, except as otherwise provided in the Copeland Regulations (29 CFR, Part 3); or

15.5.2.2 Both a basic hourly rate of pay and fringe benefit payments, by making payment in cash, by irrevocably making contributions pursuant to a fund, plan or program for and/or by assuming an enforceable commitment to bear the cost of bona fide fringe benefits contemplated by the Davis-Bacon Act, or by any combination thereof. These fringe benefit payments can be discharged only by making contributions to the same type or types of fringe benefits listed in the applicable determination. Contributions made, or costs assumed, on other than a weekly basis shall be considered as having been constructively made or assumed during a weekly period to the extent that they apply to such period. Where a fringe benefit is expressed in a wage determination in any manner other than as an hourly rate and the Contractor pays a cash equivalent or provides an alternative fringe benefit, he shall furnish information with his payrolls showing how he determined that the cost incurred to make the cash payment or to provide the alternative fringe benefit is equal to the cost of the wage determination fringe benefit. In the event of disagreement between or among the interested parties as to an equivalent of any fringe benefit, the Owner shall submit the question together with his recommendation through the appropriate Federal agency to the Secretary of Labor for final determination.

15.5.3 The assumption of an enforceable commitment to bear the cost of fringe benefits listed in the wage determination decision forming a part of the Contract may be considered as payment of wages only with the approval of the Secretary of Labor pursuant to a written request by the Contractor. The Secretary of Labor may require the Contractor to set aside assets, in a separate account, to meet his obligations under any unfunded plan or program.

15.5.4 The Owner shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the Contract shall be classified or reclassified conformably to the wage determination and a report of the action taken shall be sent to the appropriate Federal agency. If the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers or mechanics to be used, the Owner shall submit the question together with his recommendations through the appropriate Federal agency to the Secretary of Labor for final determination.

15.5.5 In the event it is found by the Owner that any laborer or mechanic employed by the Contractor or any Subcontractor directly on the site of the Work has been or is being paid at a rate of wages less than the rate of wages required by Subparagraph 15.5.1, the Owner may (1) by written notice to the prime Contractor terminate his right to proceed with the Work, or such part of the Work as to which there has been a failure to pay said required wages, and (2) prosecute the Work to completion by Contract or otherwise, whereupon such Contractor and his sureties shall be liable to the Owner for any excess costs occasioned the Owner thereby.

15.6 CONTRACT WORK HOURS STANDARDS ACT - OVERTIME COMPENSATION (40 United States Code 327-330)

15.6.1 The Contractor shall not require or permit any laborer or mechanic in any work-week in which he is employed on any Work under this Contract to work in excess of 8 hours in any calendar day or in excess of 40 hours in such work-week on Work subject to the provisions of the Contract Work Hours Standards Act unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all such hours worked in excess of 8 hours in any calendar day or in excess of 40 hours in such work-week, whichever is the greater number of overtime hours. The "basic rate of pay" as used in this provision shall be the amount paid per hour, exclusive of the Contractor's contribution or cost for fringe benefits, and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.

15.6.2 In the event of any violation of the provisions of Subparagraph 15.6.1, the Contractor shall be liable to any affected employee for any amounts due, and to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the provisions of Subparagraph 15.6.1 in the sum of $10 for each calendar day on which such employee was required or permitted to be employed on such Work in excess of 8 hours or in excess of the standard work-week of 40 hours without payment of the overtime wages required by Subparagraph 15.6.1.

15.7 APPRENTICES

15.7.1 Apprentices shall be permitted to work as such only when they are registered individually under a bona fide apprenticeship program registered with a State apprenticeship agency which is recognized by the Bureau of Apprenticeship and Training, U.S. Department of Labor, or, if no such recognized agency exists in a State, under a program registered with the aforesaid Bureau of Apprenticeship and Training. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the Contractor as to his entire work force under the registered program. Any employee listed on a payroll at any apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed.

15.7.2 The Contractor shall furnish written evidence of the registration of his program and apprentices, the ratios allowed and the wage rates required to be paid thereunder for the area of construction prior to using any apprentice in the Contract Work.

15.8 PAYROLLS AND BASIC RECORDS

15.8.1 The Contractor shall maintain payrolls and basic records relating thereto during the course of the Work and shall preserve them for a period of three years thereafter for all laborers and mechanics working at the site of the Work. Such records shall contain the name and address of each employee, his correct classification, rate of pay (including rates of contributions for, or costs assumed to provide, fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Contractor has obtained approval from the Secretary of Labor as provided in Subparagraph 15.5.3, he shall maintain records which show the commitment, its approval, written communication of the plan or program to the laborers or mechanics affected, and the costs anticipated or incurred under the plan or program.

15.8.2 The Contractor shall submit weekly a copy of all payrolls to the Owner. The prime Contractor shall be responsible for the submission of copies of payrolls of all Subcontractors. Each such copy shall be accompanied by a statement signed by the Contractor indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor, and that the classifications set forth for each laborer or mechanic conform with the Work he performed. Submission of the "Weekly Statement of Compliance" required under this Contract and the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) shall satisfy the requirement for submission of the above statement. The Contractor shall submit also a copy of any approval by the Secretary of Labor with respect to fringe benefits which is required by Subparagraph 15.5.3.

15.8.3 The Contractor shall make the records required under Subparagraphs 15.8.1 and 15.8.2 available for inspection by authorized representatives of the Owner, the State, the appropriate Federal agency and the U.S. Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

15.9 COMPLIANCE WITH COPELAND REGULATIONS

15.9.1 The Contractor shall comply with the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) which are incorporated herein by reference. In addition, the Weekly Statement of Compliance required by these Regulations shall also contain a statement that the fringe benefits paid are equal to or greater than those set forth in the minimum wage decision.

15.10 WITHHOLDING OF FUNDS

15.10.1 The Owner may withhold or cause to be withheld from the prime Contractor so much of the accrued payments or advances as may be considered necessary (1) to pay the laborers and mechanics employed by the Contractor or any Subcontractor on the Work the full amount of wages required by the Contract, and (2) to satisfy any liability of any Contractor for liquidated damages under Paragraph 15.6 hereof entitled "Contract Work Hours Standards Act - Overtime Compensation (40 USC 327-330)".

15.10.2 If the Contractor or any Subcontractor fails to pay any laborer or mechanic employed or working on the site of the Work, all or part of the wages required by the Contract, the Owner may, after written notice to the prime Contractor, take such action as may be necessary to cause suspension of any further payments or advances until such violations have ceased.

15.11 SUBCONTRACTS

15.11.1 The Contractor will insert in all Subcontracts Paragraphs 15.5 through

15.12 inclusive, respectively entitled "Prevailing Wages", "Contract Work Hours Standards Act - Overtime Compensation (40 USC 327-330)", "Apprentices", "Payrolls and Basic Records", "Compliance with Copeland Regulations", "Withholding of Funds", "Subcontracts" and "Contract Termination - Debarment", and shall further require all Subcontractors to incorporate physically these same Paragraphs in all Sub-subcontracts.

15.11.2 The term "Contractor" as used in such Paragraphs in any Subcontract shall be deemed to refer to the Subcontractor except when the phrase "prime Contractor" is used.

15.12 CONTRACT TERMINATION - DEBARMENT

15.12.1 A breach of Paragraphs 15.5 through 15.11 inclusive, respectively entitled "Prevailing Wages", "Contract Work Hours Standards Act - Overtime Compensation (40 USC 327-330)", "Apprentices", "Payrolls and Basic Records", "Compliance with Copeland Regulations", "Withholding of Funds" and "Subcontracts", may be grounds for termination of the Contract and for debarment as provided in 29 CFR 5.6.

15.13 CERTIFICATION OF NONSEGREGATED FACILITIES - (Applicable to Contracts and Subcontracts exceeding $10,000 which are not exempt from the provisions of Paragraph 15.4 "Equal Opportunity" of this Article 15).

15.13.1 By entering into an agreement related to the Work described in the Contract Documents the Contractor or Subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Contractor or Subcontractor further certifies that he will not maintain or provide for his employees any segregated facilities at any of his establishments and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Contractor or Subcontractor agrees that a breach of this certification is a violation of Paragraph 15.4 "Equal Opportunity". As used herein, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment area, transportation, and housing facilities provided for employees on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The Contractor further agrees that (except where he has obtained identical certifications from proposed Subcontractors for specific time periods) he will obtain identical certification from proposed Subcontractors prior to the award of Subcontracts exceeding $10,000 which are not exempt from the provisions of Paragraph 15.4 "Equal Opportunity"; that he will retain such certifications in his files; and that he will forward the following notice to such proposed Subcontractors (except where the proposed Subcontractors have submitted identical certifications for specific time periods):

"NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES"

A Certification of Nonsegrated Facilities, as required by the May 9, 1967, order (32 Federal Register 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a Subcontract exceeding $10,000 which is not exempt from the provisions of Paragraph 15.4 "Equal Opportunity". The Certification may be submitted either for each Subcontract or for all Subcontracts during a period, i.e., quarterly, semiannually or annually.

15.13.2 The penalty for making false statements in Certifications required by Subparagraph 15.13.1 is prescribed in 18 USC 1001.

15.14 USE AND OCCUPANCY OF PROJECT PRIOR TO ACCEPTANCE BY THE OWNER

15.14.1 The Contractor agrees to use and occupancy of a portion or unit of the Project before formal acceptance by the Owner under the following conditions:

15.14.1.1 A Certificate of Substantial Completion shall be prepared and executed as provided in Subparagraph 9.7.1, except that when, in the opinion of the Architect, the Contractor is chargeable with unwarranted delay in completing Work or other Contract requirements the signature of the Contractor will not be required. The Certificate of Substantial Completion shall be accompanied by a written endorsement of the Contractor's insurance carrier and surety permitting occupancy by the Owner during the remaining period of Project Work.

15.14.1.2 Occupancy by the Owner shall not be construed by the Contractor as being an acceptance of that part of the Project to be occupied.

15.14.1.3 The Contractor shall not be held responsible for any damage to the occupied part of the Project resulting from the Owner's occupancy.

15.14.1.4 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims in behalf of the Owner or Contractor against each other.

15.14.1.5 If the Project consists of more than one building, and one of the buildings is to be occupied, the Owner, prior to occupancy of the building, shall secure permanent property insurance on the building to be occupied and necessary permits which may be required for use and occupancy.

15.14.1.6 If such prior use increases cost of Work or delays its completion, Contractor shall be entitled to extra compensation, or extension of time, or both, but such claims for extra compensation must be in writing and must be substantiated with receipted vouchers and other supporting data.

15.14.2 With the exception of Clause 15.14.1.5, use and occupancy by the Owner prior to Project acceptance does not relieve the Contractor of his responsibility to maintain all insurance and bonds required of the Contractor under the Contract until the Project is completed and accepted by the Owner.

* * * * *

Attachment 31. Contract with Consultant

AGREEMENT

THIS AGREEMENT is entered into on the 28th day of June 1971 by and between the Southwest Regional Laboratory, hereinafter called the Laboratory, and Alta California Systems, hereinafter called ACSI.

WITNESSETH:

THAT, WHEREAS, the Laboratory intends to erect a 2 story laboratory/office type building of approximately 90,000 square feet, together with appurtenant site facilities on the property of Los Alamitos Naval Air Station, located in the City of Los Alamitos, State of California, in accordance with Drawings and Specifications to be prepared by Skidmore, Owings & Merrill Architects/Engineers.

THAT, WHEREAS, under Federal Grant OEG-0-70-5079, $4,286,000 in total funds have been provided for the project.

AND, WHEREAS, ACSI has signified his willingness to provide professional services, more specifically described as follows, necessary for completion of the project in accordance with applicable Public Laws, Ordinances, and Regulations:

NOW, THEREFORE, ACSI and the Laboratory, for the consideration hereinafter named, agree as follows:

ARTICLE 1 - SERVICES

A. ACSI agrees to provide the following acquisition and installation management services.

1. ACSI shall recommend to the LABORATORY qualified companies or firms that specialize in the furnishing and installation of electronic media systems and other equipment specified in Volumes I and II of the "Systems and Equipment Specifications" previously prepared by ACSI. ACSI will recommend only companies or firms meeting specified qualification criteria in terms of sufficient experience and adequate technical staffs and facilities to assure satisfactory performance in the furnishing and installation of the Systems and Equipment.

2. ACSI shall assist the LABORATORY in preparing bidding instructions to be issued by the LABORATORY to all companies or firms invited by the LABORATORY to submit bid proposals for the work

of furnishing and installing the Systems and Equipment. In part, such bidding instructions shall clearly inform bidders concerning the interrelation of the architectural and engineering drawings for the construction of the facilities and the specifications and other requirements for the work of furnishing and installing the Systems and Equipment and shall fully inform bidders concerning the criteria and method of evaluation that will be used by the LABORATORY in selecting the successful bidder or bidders.

3. ACSI shall prepare criteria and a method of evaluation for the LABORATORY's use in selecting the successful bidder or bidders.

4. ACSI shall review all bid proposals received by the LABORATORY for the work of furnishing and installing the Systems and Equipment and shall make recommendations to the LABORATORY as to whether or not the Systems and work proposed by the bidders, in each case, comply with the specifications and other requirements of the bidding documents; and ACSI shall make a recommendation to the LABORATORY as to the bid (or bids) which, in ACSI's opinion, most fully satisfies such specifications and requirements. ACSI's recommendations to the LABORATORY shall be made in writing.

5. ACSI shall assist the LABORATORY in supervising and inspecting the work of the contractor(s) during the installation of the Systems and Equipment. ACSI shall prepare for the LABORATORY's use such instructions to the contractor(s) regarding the work of installing the Systems and Equipment as ACSI may deem necessary to assure that the work being performed by the contractor(s) will result in an acceptable installation and satisfactory performance of the Systems and Equipment.

6. ACSI shall monitor the testing of the Systems and Equipment by the contractor(s) to determine whether or not the equipment and procedures used in such testing are suitable for such use; and ACSI shall analyze the results of such testing to determine whether or not the Systems and Equipment are performing satisfactorily within the intent of the contract documents.

7. ACSI shall perform inspections and tests of equipment and assemblies (intended by the contractor(s) for use as parts of the Systems) while such equipment and assemblies are in production at the contractor(s) plant. The number and kind of these inspection and tests shall be of a frequency and kind to enable ACSI to advise the LABORATORY as to whether or not the equipment and assemblies are suitable for use as parts of the Systems.

8. Upon notification from the contractor(s) that the Systems and Equipment are complete and ready for acceptance by the LABORATORY, ACSI shall make a final inspection of the Systems and Equipment to determine their acceptability; and shall make written recommendation to the LABORATORY regarding such acceptability. In the event the final inspection discloses defects in the contractor(s) work, ACSI shall make written recommendations to the LABORATORY concerning the corrective work the contractor(s) must perform to bring the Systems and Equipment into acceptable condition; ACSI shall continue to inspect and report on the corrective work performed by the contractor(s) until the Systems and Equipment have been brought into acceptable condition.

9. In the case of the acceptance tests to be performed on the Instructional Development Control and Monitoring System (IDCMS), ACSI shall develop error rate and other reliability criteria to be included in the RFP's for this system; ACSI shall utilize these criteria for performing an error rate analysis of the IDCMS in addition to the other acceptance tests specified for this system and described in pages 191 through 204 inclusive of Volume I "Systems and Equipment Specifications".

B. ACSI will not commit the LABORATORY to any contract amendment with any systems contractor or equipment supplier without written approval of the LABORATORY.

ARTICLE 2 - THE LABORATORY'S RESPONSIBILITIES

A. The LABORATORY shall be responsible for the following efforts:

1. The LABORATORY shall designate to ACSI in writing the representatives authorized to act for it under this Agreement.

2. The LABORATORY shall examine documents submitted by ACSI, render decisions, and advise ACSI as promptly as possible to avoid unreasonable delay in the progress of ACSI's work.

3. When deemed desirable by both the LABORATORY and ACSI, conferences will be held between representatives of the LABORATORY, representatives of ACSI, and representatives of the companies and firms specializing in the furnishing and installation of electronic media systems and equipment. The LABORATORY shall assist ACSI in arranging such conferences.

ARTICLE 3 - ACSI'S PROFESSIONAL STATUS

ACSI accepts the relationship of trust and confidence established between it and the LABORATORY by this Agreement. ACSI covenants with the LABORATORY to exercise its best professional skill and judgment in furthering the interests of the LABORATORY during the performance of the services hereunder.

ARTICLE 4 - PROJECT DIRECTOR

Mr. John V. Deal, President of ACSI, shall direct the performance of the services hereunder, and shall be the principle representative of ACSI in matters relating to the services hereunder.

ARTICLE 5 - FEE

A. ACSI estimates that a total of 170 man days at a total fee of $20,000 shall be required to complete the services hereunder. Billing rates shall be as follows:

Consultant (John Deal)	$140 per day
Research Analyst/ Managing Associate (Sue Willey)	80 per day
Engineer	120 per day

B. Prior to the commencement of work under this agreement, ACSI shall submit to the LABORATORY an estimate of the number of man days, arrayed by tasks (1) through (9) of Article 1A, required to complete the services hereunder. Thereafter, ACSI shall submit the following cost planning information on each task defined in Article 1A by the 20th of each month.

1. The number of man days expended to-date.

2. The number of man days required to complete.

Written approval to proceed with the work during the next month, shall be provided by the LABORATORY not later than the 25th of each month.

ARTICLE 6 - REIMBURSABLE EXPENSES

A. In addition to the fee, the Laboratory shall reimburse ACSI for expenditures made by personnel of ACSI in connection with the performance of the services in Article 1. Reimbursable expenses shall not exceed $3,200 without written authorization from the Laboratory and shall include the following:

1. Expense of transportation and living when traveling. Air travel shall be by tourist class and by the most direct route. Reimbursement on the basis of Twelve Cents (12¢) per mile shall be allowed for travel by ACSI owned automobile beyond a distance of 50 miles from the Consultant's office. Travel by rented automobiles shall be in automobiles classified as "standard" or "basic".

2. Expense of machine data processing when unobtainable from the LABORATORY.

3. Expense of preparing graphic materials (schematic drawing, diagrams, charts, etc.) when performed by other than ACSI or LABORATORY personnel.

4. Expense of telegrams and long distance telephone calls.

5. Expense of typing and reproducing documents when performed by other than ACSI or LABORATORY personnel.

ARTICLE 7 - PAYMENTS

ACSI shall bill the LABORATORY on a monthly basis for services plus reimbursable expenses incurred during the previous month. Payments shall be made, in each instance, within ten days of receipt by the LABORATORY of ACSI's invoice in proper form. Invoices shall include itemizations clearly showing the amount for services and reimbursable expenses invoiced.

ARTICLE 8 - SCHEDULE

ACSI is prepared to commence performance of the services hereunder upon the date of this Agreement. It is agreed and understood that to satisfy the present schedule for occupancy and activation of the LABORATORY, completion of the services hereunder must comply with the dates as specified within the modified PERT diagram previously developed for the LABORATORY under separate contract.

ARTICLE 9 - TERMINATION

The LABORATORY shall have the right to terminate this Agreement at any time by giving ten (10) days written notice of such termination to ACSI. If the LABORATORY shall terminate this Agreement, the LABORATORY shall reimburse ACSI for all service fees which ACSI has earned and all reimbursable expenses which ACSI has incurred up to the date of such termination. This Agreement shall not be assignable by ACSI without the written consent of the LABORATORY.

ARTICLE 10 - EQUAL OPPORTUNITY

The Equal Opportunity clause described in paragraph 3.09, Option B, of HEW Grant #OEG-0-70-5079 is hereby incorporated herein as a part of this Agreement.

ARTICLE 11 - EXAMINATION OF RECORDS

ACSI agrees that the Comptroller General or any of his duly authorized representatives, shall, until the expiration of five years after final payment of this Agreement, have access to and the right to examine any directly pertinent books, documents and records involving transactions related to this Agreement.

ALTA CALIFORNIA SYSTEMS	SOUTHWEST REGIONAL LABORATORY
By	By William
	June 28, 1971

Attachment 32. Construction Manager's Estimate of Costs

Turner Construction Company
FOUNDED 1902
445 SOUTH FIGUEROA STREET, LOS ANGELES, CALIFORNIA 90017
TELEPHONE: 213-683-1430

May 7, 1971

Re: Southwest Regional Laboratory

Southwest Regional Laboratory
11300 La Cienega Boulevard
Inglewood, California 90304

Attention: Mr. R. L. Christensen

Gentlemen:

We have solicited and received competitive proposals for the work on the Southwest Regional Laboratory project in Los Alamitos, California. Bids were received during the week of April 26, 1971 for all items except those listed on the attached letter to you.

It is our considered opinion, after an initial review of these bids, that the project can be completed at a cost not to exceed the amount of our Final Budget Estimate dated March 19, 1971, which is $3,373,000.

Each subcontract will be submitted for your review and approval prior to award.

Very truly yours,

J. D. Quinn, Jr.
Contract Manager

JDQj:jw

Enclosure

BOSTON • CHICAGO • CINCINNATI • CLEVELAND • SAN FRANCISCO • NEW YORK • PHILADELPHIA

Turner Construction Company
FOUNDED 1902
445 SOUTH FIGUEROA STREET, LOS ANGELES, CALIFORNIA 90017
TELEPHONE: 213-683-1430

May 7, 1971

Re: Southwest Regional Laboratory
Our Job No. 2790
Items of Work not Bid

Southwest Regional Laboratory
11300 La Cienega Boulevard
Inglewood, California 90304

Attention: Mr. R. L. Christensen

Gentlemen:

Following is a tabulation of items not included in the Bidding during the week of April 26, 1971.

A. Proposed to be bid at a later date, with approved selected bidders:

	Item	Amount
1.	Offsite Work - (when completed plans are received)	
2	Draperies - (per Addendum 2)	$ 20,000
3.	Guard Service *	25,000
4.	Line and grade engineering *	25,500
5.	Final cleaning *	23,000
6.	Wall coverings - no bidders	4,800
7.	Projection screens - no bidders	750

B. Items to be negotiated:

	Item		Amount
1.	Temporary facilities :	ie. trash *	Incl. in Cleaning
		safety protection *	5,000
		toilets *	Incl. in Rentals
		progress cleaning *	Incl. in Cleaning
2.	Miscellaneous equipment rentals :	ie. dust control site maintenance	17,500

Items noted with an asterisk (*) shall be included in the budget on an "Allowance" basis in an amount we shall estimate.

Continued . . . . . .

This list includes the "Contract" items of Work and we would anticipate certain additional gray area pieces to be missing from some of the sections bid and not yet analyzed.

If you have any questions regarding these matters, please do not hesitate to call upon us.

Very truly yours,

TURNER CONSTRUCTION COMPANY

Ralph P. Turner
Project Manager
RPT:sd
cc: Messrs. A. Braccia
R. R. Peterman
H. C. Ball
J. C. Celler
P. D. Brewer

Attachment 33. Architect's Review of Construction Manager's Estimate of Costs

APR [illegible]

Skidmore, Owings & Merrill ARCHITECTS/ENGINEERS

ONE MARITIME PLAZA
SAN FRANCISCO CALIFORNIA 94111

April 5, 1971

Mr. Robert L. Christensen
SWRL
11300 La Cienega Blvd.
Inglewood, California

Dear Rob:

We have reviewed Turner Construction Company's Final Construction Cost Estimate of March 19, 1971 which totals $3,373,000 with contingency included. This estimate listed items of "Work Not Included" which of course must be covered elsewhere in your budget.

An allowance of $30,000 for draperies/or blinds will be required. At present this item is not in the construction documents. It will be added by addendum to insure that this cost is allocated to the building.

The Turner estimate does not include work added after they received the drawings which were used to prepare the estimate. An allowance of $25,000 must be added to cover the extra fire protection work consisting essentially of fire alarm system, smoke detection system, door security, damper motors, door holders and fire and smoke dampers.

Two items which are difficult to estimate in any practical way are the three year guarantee provision required by the grant and liquidated damages applied to probably 50 or more separate contracts. We believe the liquidated damages provision is impractical and of questionable value when a construction manager is engaged to manage 50 or more separate contracts. Turner is recommending, as we do, that the liquidated damages provision be deleted.

Regarding the three year guarantee provision as opposed to our normal guarantee requirements, recent experience on the Stanford Research & Development project showed that handling this three year guarantee as an alternate results in 9 of 11 bidders adding between $13,000 to $100,000 on a 2.5 million dollar contract and two bidders stated "no bid" on the alternate. We have incorporated the three year guarantee provision in the specifications as required by the grant rather than handling it as an alternate. We must make an allowance in the estimate for this based on the Stanford experience.

We will be able to evaluate the cost of off-site work after some agreement is reached with the local communities and SWRL on extension of utilities, road adjustments, and other construction items necessary for the project.

The following summarizes our appraisal of the estimated cost of the project.

Turner Estimate - 3/19/71	$3,213,000
Contingency	160,000
Fire Protection - Added Items (allowance)	25,000
Draperies/Blinds	30,000
Three Year Guarantee Provision - allowance	50,000
	$3,498,000

Based on construction starting in May 1971, we believe an estimate of $3,500,000 plus the additional costs required to obtain the off-site facilities required by agreement with local authorities and the additional costs of those items listed as "Work Not Included", is reasonable for the construction of the building on the Los Alamitos site.

Sincerely,

SKIDMORE, OWINGS & MERRILL

Anthony A. Braccia

AAB/gs

cc: Turner Construction Co - Jack Quinn
ROFEC

Attachment 34. Agreement of Low Bidder as to Items Included in Bid

Turner Construction Company

FOUNDED 1902

445 SOUTH FIGUEROA STREET, LOS ANGELES, CALIFORNIA 90017
TELEPHONE: 213-683-1430

June 9, 1971

Re: Southwest Regional Laboratory
Our Job No. 2790-M
APPROVAL LETTER NO. 14

Southwest Regional Laboratory
11300 La Cienega Boulevard
Inglewood, California 90304

Attention: Mr. R. L. Christensen

Gentlemen:

We request your formal approval to award a Contract for the scope of Curtainwall specifications, section 8.5C in accordance with Exhibit "A" list of construction documents revised May 3, 1971 to:

Construction Metalwork Corporation
2112 N. Chico Avenue
El Monte, California 91733

for the amount of TWO HUNDRED NINETY EIGHT THOUSAND SIX HUNDRED TWENTY SEVEN AND NO/100 DOLLARS ($298,627.00).

A certified bid list is attached.

Please indicate your approval to the award of this Contract by signing in the space indicated below and return one signed copy to us.

Very truly yours,

Ralph P. Turner
Project Manager

RPT:ls

cc: Messrs. A. A. Braccia
R. R. Peterman
H. C. Ball
P. D. Brewer
J. C. Celler
R. W. Malone

APPROVED:
SOUTHWEST REGIONAL LABORATORY

By

Date 6/11/71

BOSTON • CHICAGO • CINCINNATI • CLEVELAND • SAN FRANCISCO • NEW YORK • PHILADELPHIA

SWRL - No. 2790-M June 9, 1971

Turner Construction Company

Tabulation of Curtainwall Bids

Contractors	Amount
Construction Metalwork Corporation	$ 298,627.00
Soule Architectural Products	313,200.00
Northrop Architectural Systems	331,000.00
Plaza Glass Company	336,470.00
Fentron Industries	361,992.00
Kauneer Company, Inc.	366,028.00

CERTIFIED BID TABULATION

By____________________
Ralph P. Turner
Turner Construction Company

Date 6-9-'71

Bidder's Company Name CONSTRUCTION METAL WORK CORPORATION

Address 2112 [illegible] CHICO AVENUE, SO. EL MONTE, [illegible]

Telephone 2?3-72?4

SOUTHWEST REGIONAL LABORATORY FOR EDUCATIONAL RESEARCH & DEVELOPMENT

BID FORM

(GENERAL)

April 27, 1971

Turner Construction Co.
445 South Figueroa Street
Los Angeles, California 90017

Attention: Mr. R. R. Peterman, Operations Manager

Gentlemen:

In response to your Letter of Invitation dated April 2, 1971, and Supplements 1 thru 1 thereto, the undersigned hereby proposes to provide all labor, material, equipment, transportation and services necessary for the work indicated below for the Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, California, in conformance with the Drawings and Specifications prepared by Skidmore, Owings and Merrill, for the amounts indicated below.

Bid Specifications: Volumes 1, 2 and 3.

Bid Drawings: As listed on the attached sheet.

1. Base Bid for all [illegible] work, as particularly described in specification section ~~[illegible]~~ 5.5. and INCLUDING cost of required Performance, Labor and Material Bonds, $295,627.

2. Amount included in Base Bid 1 for cost of Bonds $2,223.00

Very truly yours,

CONSTRUCTION METAL WORK CORPORATION
Company

By James E. Hargraves
[illegible] Title

Turner Construction Company

SOUTHWEST REGIONAL LABORATORIES

List of Bid Drawings, all as prepared by Skidmore, Owings and Merrill.

Sheets	A-1	thru	A-5
"	A-101	"	A-104
"	A-201	"	A-211
"	A-301	"	A-303
"	S-1	"	S-9
"	C-1	"	C-6
"	E-1	"	E-7
"	M-1	"	M-7
"	P-1	"	P-3
"	L-1	"	L-6

Specifications: Volumes 1, 2 and 3

Addendum No. 1

EXCLUSIONS:

Testing requirements for window wall,protection and final cleaning,glass breakage except our own,setting of embedded items.

S12 **CURTAINWALL** SOUTHWEST REGIONAL LABORATORY - #2790 Bid Date: 4/27/71 2⁰⁰/pm

		Const. Mgr. 3/19/71 Est.	[illegible]	[illegible]	[illegible]	PLAZA GLASS CO.	[illegible]	[illegible]
8.5C	BUILDING - WINDOW WALL	500000	[illegible]127	313200	531000	256470	561792	[illegible]
	BOND	3000	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED
8.1A	GLASS & GLAZING		[illegible]	EXCLUDED	INCLUDED	INCLUDED	INCLUDED	[illegible]
	PROTECTION FROM OTHER TRADES [illegible]		[illegible]	[illegible]				
	GLASS BREAKAGE BY OTHERS		[illegible]	EXCLUDED	EXCLUDED		[illegible]	[illegible]
	FIELD MEASUREMENTS			[illegible]				
	FURNISH IMBEDS FOR INSTALL BY OTHERS		INCLUDED	[illegible]				
	DRYWALL & DRYWALL FURRING			[illegible]				[illegible]
	PARTITION CLOSURES			[illegible]				
	COLUMN CLOSURES			[illegible]				
	FED. DRAFT INSULV. (?) FAN SEALS			[illegible]				
	TESTING REQUIREMENTS		EXCLUDED					
	FINAL CLEANING				EXCLUDED		EXCLUDED	[illegible]
	MONITOR BIRD SCREEN							[illegible]
	1/4" WIRE GLASS IN LIEU OF 3/8"				NOTED			
	LAYOUT FOR IMBEDS							
					[illegible] NOTED			
	BRIGHT DIP FINISH						[illegible]	
10.2A	MIRRORS						INCLUDED	
	TOTAL							

266

Attachment 35. Construction Manager's Analysis of Cost Savings Resulting From Construction Management

March 31, 1972

Mr. Victor Selten
Field Engineer
FECA-DHEW
11000 Wilshire Boulevard
Suite 11220
Los Angeles, California 90024

Re: Southwest Regional Laboratory
for Educational Research

Dear Mr. Selten:

In response to your request, we are pleased to provide our appraisal of the monetary benefits realized by Southwest Regional Laboratory for Educational Research and the Government through the use of Construction Management for the construction of SWRL's facilities in Los Alamitos, California.

In comparison to a hypothetical comparable building developed under the traditional linear design-bid-construct system, the cost savings produced by Construction Management, we believe, were substantial. The values of these savings could not be precisely calculated as there were no directly comparable projects constructed concurrently under the traditional system. However, the factors responsible for the savings and their approximate values can be realistically identified and are outlined on the following pages.

The success of the construction management system in reducing the overall project cost to Southwest Regional Laboratory and the Government was a direct result of a concerted team effort. The system required close and constant cooperation and interaction within the architect/construction manager/owner/agency team; and throughout the project, this was obtained. Skidmore, Owings & Merrill, experienced with construction management and fast-tracking, operated with the ability and enthusiasm for the system necessary to make it successful. The representatives of SWRL and the Facilities Engineering and Construction Agency of the Department of Health, Education and Welfare, recognized the importance of the potential time-related cost savings, and provided the necessary leadership and timely decisions and approvals required to produce those savings.

It is the opinion of Turner Construction Company that the development of this team cooperation is the most important contribution of construction management. It is this factor which permits and encourages the type of cost saving procedures outlined below.

Design Development Consulting

During the period of Design Development, Turner, in close cooperation with the Architect and Engineer, provided material assistance in the selection of economical and efficient building systems, materials and details. This assistance, taking various forms, was instrumental in providing overall construction economy without sacrificing the quality of construction, and ultimately building performance.

The most evident of the various forms of assistance was relative cost studies of alternate systems, methods and materials. Following are representative examples of the relative cost studies undertaken:

1. Alternate exterior wall systems

    (a) Aluminum and glass curtain wall
    (b) Precast concrete and glass
    (c) Glass window wall and aluminum mullions

2. Alternate floor systems

    (a) Metal deck, spray fireproofing, 2 1/2" concrete fill
    (b) Metal deck, 3'4" concrete fill

3. Finish of aluminum exterior wall

    (a) Bright dip anodized
    (b) Natural anodized

4. Alternate piling systems

    (a) Precast concrete
    (b) Step tabered

5. Alternate partition systems

    (a) Kaiser 500
    (b) Vaughn wall

6. Alternate lighting systems

    (a) 2' x 2' fixtures
    (b) 2' x 4' fixtures

7. Alternate elevator manufacturers

8. Alternate heating, ventilating and air conditioning systems

9. Alternate power distribution systems

The cost saving actually generated by the selection of the most economical systems identified in the various studies was approximately $200,000.

In addition to this direct cost reduction, a saving in project development time was provided by the simultaneous design-costing procedure. Under this program, relative costs could be determined without complete plan development, thus shortcutting the more common procedure of completing the design for each alternate system for the purpose of requesting alternate prices on a lump sum bid. Further, lengthy periods of evaluation and subsequent redesign inherent in the Government's commonly used value engineering procedure were eliminated by this concurrent design/value engineering program. Not incidentally, the savings generated reverted in full to the owner and were not shared with a proposing contractor.

Purchasing

The second of Turner's major functions as Construction Manager was the establishment and maintenance of a comprehensive purchasing program. This program included, among other things, dividing the construction work into logical, non-conflicting bid packages, developing bidder interest, establishing and enforcing bidder qualification criteria, analyzing the bid documents for completeness and clarity, and receiving and analyzing the specialty contractor bids.

The results of this orderly, professional Purchasing Program, in our opinion, were lower and more competent specialty contractor bids than would have been generated by the traditional general contract bidding procedure. Additionally, under the CM system, the benefits of this better buying accrued to the owners rather than a general contractor.

The sharper pricing developed as a result of the elimination of some of the normal uncertainties of subbidding. First, the bidders were aware of the identity of the managing contractor, how the job would be run, and under what form of contract. Secondly, they were aware of a firmly established award procedure based on the initially submitted price and not on a later negotiation. Additionally, a clear schedule of sequence of operations and time was avilable to the bidders. This schedule enabled them to foresee their relationship with other contractors working simultaneously and to predict their wage rates and material costs at the time of their operations.

Although the cost benefits affected by this purchasing control could not be precisely determined, it is our opinion that specialty trade costs were approximately 1% or $30,000 lower than would have been the case under the traditional procedure.

Another benefit directly attributable to the purchasing program, was the limitation of change orders during construction to an unusually low cost. Before and during the specialty trade bid period, Turner reviewed the plans and specifications for areas of indefinite or unspecified responsibility, and incomplete documentation. Through directives to the prospective bidders, many of these potential trouble spots were eliminated before bids were received. Other potential change order items were uncovered in the careful and detailed analysis of bids received. These gaps were then closed before contract awards, thus assuring a more favorable buy.

Compared to the more typical situation, in our opinion, the project saving attributable to this limitation of change orders was approximately 0.5% of the construction cost or $15,000.

Field Initiated Savings

Through the day-to-day on-site activities of managing job progress and quality, the construction manager often notices various cost saving opportunities. One such opportunity presented on the SWRL project was a change in the surface drainage system. Working in close cooperation with the Architect and the officials of Los Alamitos Naval Air Station, the Field Management devised a revised system incorporating higher building and site elevations and reducing the intrusion on Air Station property. The results of this change were a net cost saving of approximately $40,000.

Fee

As utilized on this project, construction management substantially limited the monetary risk of the construction manager as compared to that of a general contractor. Due to this limitation of rist, the CM, who in effect is filling the role of a general contractor, can operate on a lower fee than could a general contractor. For this reason, Turner, as the CM, was able to offer a fee lower by 1 1/2% of the construction cost, or $45,000, than it could have as a general contractor.

Time

Perhaps the most dramatic cost saving produced by the construction management system on the SWRL project was the result of a reduction in the time required for the design and construction of such a facility. There were numerous operative factors responsible for this time reduction, some of which are indicated here. The Designer/CM interaction concurrent with design development permitted timely decisions based upon current market knowledge, thereby eliminating lost time caused by redesign to incorporate cost-cutting changes.

Expeditious development of contractor bid interest and processing of documents during the bid period permitted an abbreviated bid period. Solid purchasing experience permitted an expeditious preliminary appraisal of bids and a priority system for award of contracts permitted the award of contracts for long lead items, such as structural steel, within a week of the receipt of bids.

In our opinion, having the manager of the construction progress working on behalf of the owner rather than for his own interest was instrumental in controlling the pace of the field work. This control resulted in the completion of the project a month earlier than originally scheduled, and prevented the usual extensions to the time of completion.

We believe the decrease in development and construction time directly attributable to the construction management procedure was approximately 4 to 5 months. At the time this project was bought, construction costs were escalating at the rate of 1% per month. Thus the savings in construction costs alone due to this time saving was approximately $150,000.

There were, of course, costs related to time inherent in SWRL's operations. William H. Hein, Jr. in his Technical Note "Fast-Tracking Federally-Supported Construction of Educational Research and Development Facilities" estimates these costs at $100,000 for each month that the new facilities could not be occupied. Based on the 4 to 5 month time saving noted above, the savings to SWRL were approximately $500,000.

In summation, the monetary benefits gained from the use of construction management for the construction of the SWRL facilities resulted from plan development consulting, the purchasing program, from field control, risk reduction and time-savings and were approximately $1,000,000 in value.

It has been a pleasure for us at Turner to work with you and your FECA staff on this project, and we look forward to additional opportunities with much interest.

Very truly yours,

D. B. Sibson
Contract Engineer

DBS:cm:sb